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THE IMPLEMENTATION AND FUTURE OF DECIMALIZED MARKETS

HEARING

BEFORE THE

SUBCOMMITTEE ON SECURITIES AND INVESTMENT

OF THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS UNITED STATES SENATE

ONE HUNDRED SEVENTH CONGRESS

FIRST SESSION

ON

THE CURRENT STATUS OF IMPLEMENTATION OF DECIMAL PRICING FOR SECURITIES, INCLUDING AN ESTIMATION OF COSTS AND BENEFITS

MAY 24, 2001

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C O N T E N T S

THURSDAY, MAY 24, 2001

WITNESSES

THE IMPLEMENTATION AND FUTURE OF DECIMALIZED MARKETS

THURSDAY, MAY 24, 2001

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
SUBCOMMITTEE ON SECURITIES AND INVESTMENT,
Washington, DC.

The Subcommittee met at 10 a.m., in room SD–538 of the Dirksen Senate Office Building, Senator Michael B. Enzi (Chairman of the Subcommittee) presiding.

OPENING STATEMENT OF SENATOR MICHAEL B. ENZI

Senator ENZI. Let me call the Subcommittee to order.

I am not sure how many people will be attending. There are a number of things happening in Washington today, virtually at this moment. But some of us intend to get the business at hand done.

I want to thank Ms. Laura Unger and the other witnesses today for taking the time to appear before this Subcommittee and share their views on how decimalization has affected the U.S. securities market.

While we always compress a little bit to get the main substance from the testimony, everyone's complete testimony will appear as part of the record. When the hearing is over, we will leave the record open for additional questions for those of my colleagues who may not make it in at some point during the hearing.

The use of decimal pricing marks a fundamental change to the way the market participants interact. As with any significant change, it will take time to fully adjust to the new pricing increments. Most of the reported problems associated with decimalization are not new. Instead, they are old problems that have been exacerbated and the phraseology has changed a little bit by decimalization. However, there have been some benefits to the decimal conversion, such as the narrowing of spreads. Additionally, securities are now priced as all other countries' are priced—and that is in decimal increments.

I am very confident that the industry will fully adjust to the decimalization of the securities markets. These challenges will provide the Subcommittee with an opportunity to examine the structure of the market. It calls for reviewing the need of certain rules, such as the short-sale and trade-through rules. The Subcommittee will continue to work with the industry to ensure that any adjustments made are in the best interest of investors and the U.S. capital markets.

I look forward to hearing the testimony of everyone today. I appreciate Senator Corzine being here and invite him to move closer to the front if he would like.

[Laughter.]

I know that got him in trouble once.

[Laughter.]

COMMENTS OF SENATOR JON S. CORZINE

Senator CORZINE. It would be my pleasure, Mr. Chairman.

I want to thank you and Senator Dodd for having this hearing. This happens to be something that I have spent a little bit of time with on the other side of table.

I am very much supportive of and know that there are transitional issues here, but one that I think in the long run will serve investors and the providers of investment services great advantage over the long run. I am anxious to hear how this is going and look forward to hearing the testimony.

Senator ENZI. Thank you.

Our first witness today is Ms. Laura Unger, the Acting Chairman of the U.S. Securities and Exchange Commission. We are anxious to hear your testimony. Go ahead and begin.

STATEMENT OF LAURA S. UNGER
ACTING CHAIRMAN
U.S. SECURITIES AND EXCHANGE COMMISSION

Ms. UNGER. Chairman Enzi, and Senator Corzine, thank you very much for your invitation to speak.

I am pleased to testify today on behalf of the Securities and Exchange Commission about the recent conversion to decimal pricing and the effects that this change has had on market dynamics and trading behavior.

As you know, under the leadership of Congress, over the past year, U.S. markets have successfully moved from pricing shares in fractions to pricing shares like everything else, as you said, Chairman Enzi, in dollars and cents. The goal of decimalization was to simplify pricing for investors and to make our markets more competitive internationally. Decimalization was also expected to ultimately reduce trading costs for investors by narrowing quotation spreads, from the $1/16$ minimum increment, or 6.25 cents, that was standard in the fractional environment, to a penny.

While comprehensive analyses of the market effects of decimalization are not yet available, I am pleased to report that preliminary reviews by the Commission and the markets indicate that these goals have been largely met. For example, quotation spreads in New York Stock Exchange securities narrowed an average of 37 percent, and effective spreads in those securities narrowed about 15 percent. An even more dramatic reduction in quotation spreads was observed in Nasdaq securities, with spreads narrowing an average of 50 percent. While it is difficult to estimate the overall cost savings to investors, the narrowing of spreads makes it likely that investors entering small orders that are executed at or within the quotes are experiencing reduced trading costs.

Nevertheless, we recognized that the shift to decimal pricing was a fundamental market structure change that had the potential to affect the transparency, liquidity, and fairness of the markets. So, as a result, in June 2,000, the Commission required that the markets carefully phase-in decimal pricing. We also hosted a roundtable last December to solicit views on how the early phases of decimalization were affecting markets and trading.

In addition, the Commission has asked the markets to conduct their own studies that would analyze how the conversion was affecting systems capacity, liquidity, and trading behavior, as well as investor protection. In view of the complexity of these issues, the Commission has extended the deadline for these markets' studies from July 8 to September 10, 2001. In the meantime, we are continuing to work with the markets and market participants to identify any aspects of decimalization that might compromise the fair and orderly operation of the securities markets.

Today, I would like to focus on how decimalization has affected market transparency, liquidity, and key investor protections.

As far as market transparency and liquidity are concerned, as the minimum quoting increment has narrowed to a penny, the market depth—the number of shares available at the published bid or offer—has decreased as well. Preliminary estimates indicate that the New York Stock Exchange quote sizes have been reduced an average of 60 percent since the decimal conversion, and Nasdaq quote sizes have been reduced about 68 percent. Some firms and institutional investors have expressed concerns that the reduction in quoted market depth may be adversely affecting their ability to execute large orders. They have indicated that smaller pricing increments have increased the risk that large limit orders will not be executed. Instead, other market participants will use the information provided by these limit orders to step ahead of the orders for a penny. This practice could ultimately lead to a reduction in the amount of liquidity.

In an effort to provide more information about available liquidity, the Commission accelerated the approval of a New York Stock Exchange rule change in March of this year to disseminate "depth indications" and "depth conditions" to reflect market interest in a security below the published bid and above the published offer.

Decimal pricing also raises a number of key investor protection issues. For example, Commission and market rules protect customer limit orders by providing them with priority over specialist and market maker proprietary orders at the same price. New York Stock Exchange and NASD rules require that a specialist or market-maker who wants to "step ahead" of a customer limit order pay a price that is greater than the limit order by at least the minimum quoting increment. With the conversion to decimals, this minimum increment is only a penny. This means it will be less costly for specialists, market makers, and possibly other market participants to profit from their knowledge of limit order flow by trading ahead of limit orders for only a penny a share. The fact that professionals may have an unfair advantage over the little guy is of concern to the Commission. So, together with the SRO's, we are currently gathering information about the operation of these investor protection rules in the decimal environment and will consider whether any action is necessary to protect investors.

Finally, I should note that many of the issues raised by decimals may be exacerbated by the practice of trading at increments of less than a penny, so-called "subpenny" trading. Subpenny trades by electronic trading systems and market makers currently account for only about 4 to 6 percent of trades in Nasdaq securities. But the Commission intends to further study the impact of subpenny trading on market transparency and liquidity, as well as investor protection and market integrity rules.

In summary, while the decimal conversion went smoothly from an operational standpoint, our work in this area is far from complete. I want to assure you that the Commission will continue to work with the markets and the securities industry to address potential problems while preserving the benefits of decimalization.

We appreciate the continuing interest of the Subcommittee in this issue and the role that the Subcommittee has played in helping to ensure a smooth transition to decimals.

Thank you very much.

Senator ENZI. Thank you for what you said and your more extensive testimony.

We are all anxious to see what direction things are going and what changes might be made. In your testimony, you mentioned that the Securities and Exchange Commission approved a pilot rule filed by NASD, specifying certain protections to customer limit orders priced in increments smaller than a penny, or subpennies.

Do you believe there is a trading increment that might be too small for efficiencies to be realized in the market, particularly in the listed market? Is there a minimum increment that should be set?

Ms. UNGER. Well, Mr. Chairman, when we were talking about the conversion to decimals, the biggest debate was whether it would be nickels or pennies. At that time no one really contemplated that it would be something smaller than pennies. We are all very surprised by a conversation about subpennies. But that is the conversation that we are having.

It is not something that the Commission would like to dictate in terms of what the appropriate increment should be. We are concerned about some of the issues that the smaller increments will raise in terms of our regulatory responsibility over the marketplace. And those are, capacity issues and the whole issue of stepping ahead of a customer order, the smaller the increment, the easier it is, and the more incentive you might have to do it.

It could result in less transparency. If people stop using limit orders because they are not getting filled because they are being stepped ahead of, then what will happen to transparency in the market overall?

I do not think we want to dictate to the industry on this issue and would prefer an industry solution to this problem. But I would assume it is a problem for them as well.

I am saying, no, we do not want to say what the increments are.

Senator ENZI. Okay. You are not suggesting a change at the moment.

Ms. UNGER. No, I do not think so. But, again, the notion of trading in subpennies raises a number of regulatory issues. And also flickering quotes and complying with the short-sale rule and a whole host of other issues. We are expecting to hear from the industry what their recommendations will be. We will have more statistical information about what the exchanges experienced with decimals trading in the fall, and they will have to submit to us rule changes by November 10.

Senator ENZI. You mentioned the short-sale rule, and that you are gathering data and considering changes. I know that the SEC began its concept release in October 1999, which seems to be an adequate time for review, even in the light of the relatively new decimal pricing. What changes are you considering and when do you expect to have a change of that rule?

Ms. UNGER. With respect to the short-sale rule?

Senator ENZI. Yes.

Ms. UNGER. I think we take the position that the short-sale rule doesn't make sense as currently drafted in the decimals environment because of the flickering quote issue. It is too hard to comply with the rule, and it would be too easy to manipulate.

We are working right now diligently on drafting a rule change, and we should be ready to release a draft of that soon, and put it out for comment.

Senator ENZI. Senator Corzine.

Senator CORZINE. Has the concept of block trading been affected by the decimalization, which gets at much of the depth issue.

Ms. UNGER. Right. I would assume that if people are talking about an order of a thousand shares being difficult to fill in the decimals environment—not difficult to fill—but requiring more transactions to complete, that block trading would be affected by decimals as well.

I have not heard a lot of anecdotal evidence about that specifically, other than that the institutions seem more concerned about the limit order issue and not having the orders filled. So I suspect we will have more information about that, and perhaps the New York Stock Exchange has something on that.

Senator CORZINE. Right. In the depth indicators, has there been an embracing of this concept? Is it working? How do you feel? You commented on it. I am actually curious how that works.

Ms. UNGER. Well, the depth indicator is not very precise at this point. I think all it shows is that there are a certain number of shares within a parameter, a price parameter, where there is an interest. But it does not say how many shares and at what price.

The New York Stock Exchange is refining that a little bit more and will be working on providing some more specific information as to the depth of interest.

Senator CORZINE. Refresh me. Nasdaq actually shows the depth indicators, makes it available, the amount of shares sought or offered at a particular price level.

Ms. UNGER. At a particular price level—at a quote, yes. But I am not sure that it is to the extent that you are talking about.

And I think the Super-Montage proposal that was approved by the Commission would probably address a lot of the concerns in terms of showing the depth of the book further down than the quoted price.

Senator CORZINE. It seems that a number of those kinds of transparency initiatives might correct some of these problems. Are those being reviewed by the industry or asked to be commented and promoted as concepts, or at least considered as concepts?

Ms. UNGER. So far, the only thing that the Commission has received in terms of a proposed rule by one of the SRO's is the New York Stock Exchange's depth quote proposal. And we approved it expeditiously on an accelerated basis. So, yes, we would embrace solutions to this problem of showing the depth in a quote.

Senator CORZINE. Is there anecdotal evidence of charges of stepping ahead, or front-running, by small increments to break up trading patterns?

Ms. UNGER. Yes. As I said in the testimony, there is concern particularly among institutional investors that the limit orders will go away because of the fact that it is so easy to step ahead of the limit orders and they are not being filled.

There is a concern, then, if there aren't limit orders, which the order handling rules require to be displayed, what will happen to the transparency in the marketplace? And that is actually a step backward in terms of enhanced transparency. That is something that we are definitely concerned about.

Senator CORZINE. And the available liquidity issues, you always have the risk of a fallacy of composition. We have gone through a much more turbulent or volatile period in the first 4 or 5 months of the year. I presume that the overlay of that in conjunction with the change to decimalization could have different interpretations.

There is different levels of liquidity, I suppose, in so-called bear markets or highly volatile markets than there would be in straight-line moves.

Ms. UNGER. Well, I haven't heard of any studies tying the volatility of the market to decimals trading. I think it is all Regulation FD, actually.

And not that, either.

[Laughter.]

Senator CORZINE. I would encourage, though, that when one looks at whether decimalization is working, and I use it as a generalization, we want to be careful that one doesn't confuse a different market environment for the diminishment of liquidity versus the execution of the decimalization process because it wouldn't be intuitively obvious whether it was because markets are volatile and would have been volatile in other environments as well, and you might have less activity.

Ms. UNGER. Where it really comes into question is if you have customer orders of, say, over a thousand shares. Then it is hard for us to ascertain what the cost savings is that decimals provide, because if you have to execute that trade or transaction in multiple trades, then you have trading costs associated with that. And do those trading costs then exceed the savings that you have by a narrowed spread brought about by decimals?

Senator CORZINE. Right.

Ms. UNGER. So that is really something that is going to take a little time to figure out.

Senator CORZINE. Thank you, Mr. Chairman.

Senator ENZI. I want to thank you for your testimony and the questions that you have answered. And I am sure that there will be more questions.

There are a number of meetings that an hour ago were not scheduled around the Senate that are happening at the moment to figure out some changes that are in process. So several of the Members interested in this hearing were not able to be here.

Ms. UNGER. Thank you very much for the opportunity to testify, Mr. Chairman.

Senator CORZINE. Thank you.

Ms. UNGER. If any of the Members have any follow-up questions that they would like to submit, of course, we would be happy to answer them in writing.

Senator ENZI. Thank you very much.

Ms. UNGER. Thank you.

Senator ENZI. Our next panel consists of: Mr. J. Patrick Campbell, who is the President of Nasdaq U.S. Markets and the Chief Operating Officer of The Nasdaq Stock Market, Inc.; Ms. Catherine R. Kinney, Group Executive Vice President of the New York Stock Exchange; Mr. Kenneth D. Pasternak, Chairman and Chief Executive Officer, Knight Trading Group, Inc.; Mr. Don Kittell, Executive Vice President of the Securities Industry Association; Mr. Peter Jenkins, Managing Director and Head Equity Trader of Zurich Scudder Investments; and Mr. Robert B. Fagenson, Vice Chairman of Van der Moolen Specialists USA.

I thank all of you for being here this morning. Again, we have all of your testimony as part of the record. So if you can summarize that for us and make your comments in a 5 minute period, we would appreciate it.

Mr. Campbell.

STATEMENT OF J. PATRICK CAMPBELL
PRESIDENT, NASDAQ, U.S. MARKETS AND
CHIEF OPERATING OFFICER, THE NASDAQ STOCK MARKET

Mr. CAMPBELL. Good morning, Chairman Enzi, Senator Corzine.

I am Pat Campbell, President of Nasdaq U.S. Markets and Chief Operating Officer of The Nasdaq Stock Market. We welcome this opportunity to share with you our experience and insights into the recent conversion to decimal pricing on the Nasdaq market, although it has only been about 7 weeks.

As the world's largest stock market, ensuring that decimalization was not disruptive to our investors and the U.S. capital markets was our primary concern. Crucial to our job as the world's largest provider of stock quote information is maintaining the availability, integrity and accessibility of this data. The estimates of increased computer demands prior to decimalization made switching a challenging project. One study projected a three-fold increase in quotation traffic. Decimalization takes the market from 16 price points per dollar to 100 price points. Due to the hard work of our highly skilled employees, our member firms, and the Securities and Exchange Commission, I am glad to report that the decimalization was accomplished without incident.

As the engine of the new economy, Nasdaq is dynamic and is adjusting to changing market realities in order to better serve our listed companies, member firms, and investors. As you may know, Nasdaq applied to the Securities and Exchange Commission to become a registered national securities exchange in November of last year. We expect the SEC to publish our application for public comment in the *Federal Register* in the immediate future, and we are hopeful for a speedy approval at the end of the comment period. This process will facilitate final separation of Nasdaq from the NASD, lead to our ability to access the capital necessary for our Exchange to invest in new technology in order to remain a competitor in the world capital markets.

I would now like to share with you our experience with decimalization. Again, I caution these initial trends are observed through a fast-track analysis. The three most important points I wish to share with you today are: First, Nasdaq's transition from fractions to decimals was smooth and seamless. To achieve today's results in a 5 week period, virtually every computer system within Nasdaq was changed. A similar effort took place among Nasdaq broker-dealers. This followed two pilots of decimalization in March of this year. On April 9, all remaining Nasdaq-listed securities began to be quoted in decimals. Thus, Nasdaq has successfully completed the full conversion to decimals in approximately 1 month. Nasdaq has been carefully monitoring the impact of decimalization both through our on-line surveillance and market operations group and by gathering and analyzing data for the 2 week period prior to decimalization and the period following decimalization.

I would like to add that Nasdaq during all of this set a new share volume record only 7 days after full conversion to decimals of approximately 3.2 billion shares, and was able to handle that volume without incident.

The second major observation we have is Nasdaq's market has seen a dramatic decrease in spreads. As expected, quoted spreads declined substantially for most stocks. Quoted spreads on average decreased by 51 percent. Our most active stocks saw a 71 percent spread decline. Many of Nasdaq's well-known and widely held stocks, such as Cisco, Dell, Intel, Microsoft, and others have now quoted spreads of one cent. Similarly, effective spreads declined for all stock groups by an average of 46 percent. This is in addition to the 30 percent decline seen following the order handling rules and move to $\frac{1}{16}$ in 1997.

The third and last observation is that there is no evidence on our market, to date, that the institutional investors are bearing the burden of any significant cost-shifting.

We looked at large trades to see if decimalization thinned-out the market and caused effective spreads for large institutional trades to increase. Our preliminary evidence is that they did not.

One issue that has caused significant controversy within the industry but not in the Nasdaq market with a shift to decimals was pennying. On this issue it is useful to recognize that the advantages allowed by Nasdaq's market structure of a hybrid market with electronic communications network and competing dealers have not to date experienced a pennying issue in our market.

We also believe competing market makers and ECN's will continue to provide a market environment that discourages unfortunate behavior. In fact, it is important to note that Nasdaq has been trading in pennies prior to April 9, 2001. Decimalization for Nasdaq was an issue of quoting in pennies.

Overall, the implementation has been seamless. It is still a work in progress. We expect to continue to report our progress to you, the industry, and to the SEC.

As more time passes, we could see the results change over time. We plan to continue to conduct our final detailed analysis for all three phases of decimalization as the SEC is requiring soon. We are committed to keeping you apprised of any future developments.

Thank you.

Senator ENZI. Ms. Kinney.

STATEMENT OF CATHERINE R. KINNEY
GROUP EXECUTIVE VICE PRESIDENT
NEW YORK STOCK EXCHANGE

Ms. KINNEY. Chairman Enzi and Senator Corzine, my name is Catherine Kinney and I am a Group Executive Vice President at the New York Stock Exchange. And I am very pleased to be here today to relate some of the preliminary results of decimal trading.

Decimalization has been one of the most important occurrences in our capital markets in the last quarter century. Congress and the SEC directed this initiative to accomplish significant policy goals. The NYSE is pleased to have facilitated this conversion process. The benefits of decimal trading have been realized, but the shift to a minimum price variation, or MPV, of one penny has created some difficulties. The New York Stock Exchange is already taking steps to remedy some of these detrimental effects. In this regard, we urge that the MPV be no less than one cent and that it be established by Congress or the SEC across all markets. Otherwise, the current difficulties will become worse, and the benefits of decimalization may be jeopardized.

The Exchange is proud that our conversion to decimals was accomplished well ahead of the SEC's deadline without any systems or capacity problems. Most of our decimal conversion costs were incurred simultaneously with Y2K system conversions and cost about $30 million.

The Exchange launched decimal trading with a pilot project of seven stocks in August 2000. Stocks in the pilot were priced in dollars and cents instead of fractions, and the minimum pricing increment was one penny instead of $\frac{1}{16}$ of a dollar. The pilot was extended to an additional 57 stocks in September and 94 stocks on December 4. The entire floor was converted on January 29, 2001, which was 2 months ahead of the SEC's deadline of April 9.

We are confident that the conversion to decimal pricing has accomplished important public policy goals. It has certainly brought the U.S. markets into conformity with the quoting and trading systems that are used around the world. This will help the U.S. equity markets to expand their foreign listings, make us more competitive in trading with foreign markets, and certainly will facilitate the globalization of equity markets.

Our preliminary analysis of conversion to decimal pricing indicates that, on balance, the penny increment has been good for some small retail investors. Stock prices in decimals are certainly more understandable. Over the last decade, direct share ownership by individual investors has certainly increased, and decimal prices will encourage this trend by breaking down a barrier to understanding the markets.

Spreads have been reduced by approximately 37 percent and price improvement has been significantly increased, particularly for smaller orders. On the other hand, the one-cent MPV has significantly impacted institutional investors. It is premature to draw any sweeping conclusions, but we have observed some trends that I would like to summarize.

Decimal trading has had a number of detrimental impacts on mutual funds, pension funds, and other institutional investors who act on behalf of individual investors. These investors, who tend to trade in large blocks, have experienced reduced depth at the NYSE quote or the best bid and offer. They have experienced a lack of transparency of depth or liquidity outside the best bid and offer. And they have experienced an increased number of execution reports, that is, the number of transactions that are necessary to fill an order. These market participants are a very important part of our liquidity.

The impact on institutional investors is an inevitable outgrowth of the decrease in the minimum price variation from 6¼ cents to one cent. This decrease in the MPV has lowered the transparency of the market and thus made it harder for institutional investors to find the right price for liquidity that they require.

Our research to date shows a significant 67 percent decrease in the number of shares available at the published NYSE quote. While true liquidity—that is, actual interest from all sources—available may not have been significantly impaired, there is a significant impairment of transparency.

We have acted to address the transparency concerns of the institutional investor. The Exchange as you have heard this morning, has initiated two changes to permit dissemination of depth indications and depth quotes in our listed securities. These initiatives are the first in a series of actions that the Exchange will implement to improve transparency and communication of market depth in a decimal trading environment.

Next month, we will also put forward an initiative called Open Book, and we have certainly expanded the use of hand-held terminals to brokers on our trading floor. In addition, we have formed an Advisory Committee on Decimalization to review decimal trading at the Exchange and to make recommendations.

We are reviewing Exchange trading rules to ensure that they are appropriate for the changes that are occurring. We will also be working with academics to study these issues.

The SEC has requested that we provide a preliminary report by September 10 on the impact of decimal trading. The SEC has further requested all markets to submit by November 4 proposed rule changes establishing their individual choice by markets of the minimum pricing increments.

We believe an MPV of less than a penny would undermine the benefits that decimal pricing has brought to the markets, while at the same time exacerbating the problems that decimal pricing has caused for institutional investors. In addition, the problems that institutional investors have faced in trading at an MPV of one cent would be exponentially increased if the markets were permitted to quote and trade in increments of less than one cent.

I appreciate the opportunity to testify here today, and I would be pleased to answer any questions.

Senator ENZI. Thank you very much.

Mr. Pasternak.

STATEMENT OF KENNETH D. PASTERNAK
CHAIRMAN AND CHIEF EXECUTIVE OFFICER
KNIGHT TRADING GROUP, INC.

Mr. PASTERNAK. Chairman Enzi, Senator Corzine, good morning. Thank you for this opportunity to testify today about the impact of trading in decimals. My name is Kenny Pasternak. I am Chairman, CEO, and President and Co-Founder of Knight Trading Group, the world's largest wholesale market maker for shares of both Nasdaq and non-Nasdaq equities.

Knight Trading Group supports decimalization. By making stock prices easier to understand, decimalization encourages market participation and therefore benefits everyone.

The U.S. stock markets recently adopted decimalized trading in the belief that it would narrow spreads and lead to less costly order execution. There is no doubt that spreads have fallen. In many instances, order execution has become more costly, not less. My purpose today is to focus this Subcommittee's attention on this issue.

It is important to know that the introduction of decimalized pricing is not itself responsible for the narrowing of spreads. Rather, spreads have narrowed as a result of the decision by major market centers to reduce their minimum price variation—sometimes called MPV—to a single penny.

Today's one-penny MPV has reduced price discovery, diminished liquidity, and increased the level of trading activity required to execute an entire order in many instances. No market participant has an incentive to quote size, as others can easily coopt that information and trade ahead by as little as one penny. While such problems were once experienced only by institutional investors, they are now affecting increasing numbers of individual investors as well.

The one-penny MPV is, in many circumstances, too small. In my view, the most important issue for this Subcommittee's consideration is how to encourage the markets to arrive at the correct MPV for a given set of circumstances. This issue is vital to the depth, liquidity, and overall strength of our markets.

Preliminary data suggests that, even for retail-sized orders, trading outside the spread has increased dramatically. The price discovery process has been impeded because the displayed depth on Nasdaq has also declined to approximately one-third of what it was before the transition to trading in decimals began. Meanwhile, we see that more and more investors feel compelled to break down their buy and sell orders into smaller lots in order to achieve more control over their executions. Trades generally have increased in number, but have declined substantially in size.

In addition, the one-penny MPV has occasioned a significant decline in the average number of market participants at the inside quote. In other words, those who provide enhanced liquidity to the markets are now committing less capital for the execution of individual investor trades than they did before the one-penny MPV.

Those who proactively provide enhanced liquidity constitute a large and highly competitive industry that is absolutely essential to the efficient operation of the markets. They often provide liquidity automatically in amounts considerably larger than the NBBO. This automatic execution feature expands as the MPV increases and shrinks as the MPV decreases.

Presently, because of the one-penny MPV, many retail investors are paying more as the nature of executions changes from fast and complete to slow and fragmented. During the month of January, Knight Securities alone provided liquidity above the National Best Bid and Offer size level in excess of 179 million shares. Without our enhanced liquidity, we estimate conservatively that investors would have paid nearly $4 million additional in execution costs.

With the advent of the one-penny MPV, we and our competitors are providing enhanced liquidity in fewer instances. Whereas, we previously provided instantaneous, automatic execution at the NBBO price for any order of up to 2,000 shares, we now reserve automatic execution for much smaller orders. And in many instances, we do not offer automatic execution no matter how small the order. This decline in availability of enhanced liquidity for Nasdaq stocks, coupled with the lower average quoted size, translates into slower and more fragmented executions—and ultimately, higher costs for individual investors.

In the listed markets, what we are seeing is a pronounced increase in a number of ITS trade-throughs. This means that the investor may actually receive a price dis-improvement.

During the first 6 trading days in February 2001, when decimal trading was introduced in all listed stocks, Knight Capital Markets experienced an average of more than 2,500 trade-throughs per day by NYSE members, a more than four-fold increase over the predecimalized period.

Before investors can realize the full benefits of decimalization, including cheaper order execution, Congress, the SEC, and the major market centers must address the negative consequences of narrowing spreads. Some of the blame can be traced to outdated rules and regulations that were written for an era of fractional pricing and substantially larger MPV's.

I have addressed the most important of these issues in my written testimony. The implementation of trading in decimals has made the markets more accessible to investors, but it has also led to a number of profound changes that diminish market liquidity, as well as the speed and efficiency with which investor orders are being executed.

Only by recognizing and adapting to the changes occurring in the U.S. markets can we continue to protect the investor, strengthen market integrity, and maintain the position of leadership that our market enjoy globally.

As this Subcommittee ponders the significant policy issues surrounding decimal pricing, my colleagues and I at Knight would welcome any opportunity to contribute further to the discussion.

Thank you.

Senator ENZI. Thank you.

Mr. Kittell.

STATEMENT OF DONALD D. KITTELL
EXECUTIVE VICE PRESIDENT
SECURITIES INDUSTRY ASSOCIATION

Mr. KITTELL. Chairman Enzi, Senator Corzine, thank you very much for the opportunity to speak on behalf of the Securities Industry Association today.

The SIA has worked for over 3 years with securities firms, the equities and options exchanges and Nasdaq, clearance and settlement organizations, service bureaus, market data vendors, the SEC, the Department of Justice, the General Accounting Office, a group of over 500 diverse organizations to convert the U.S. markets to decimals. We estimate that the conversion cost the industry approximately $1 billion, of which about $600 million we attribute to increases in capacity.

The operational aspects of the conversion were completed without incident and I would particularly credit the leadership of the New York Stock Exchange, Nasdaq, as well as my colleagues testifying today, for that successful result.

I have four observations.

The first is that the conversion was a positive step for investors and for the securities industry. The language of decimals is easier to understand. The U.S. markets now speak the same language as markets around the world. The opportunity for competition between market participants has been increased. We eliminated two particularly aggravating problems—the cloud of suspicion that hung around fractional trading and the image of Spanish antiquity with references to pieces of eight both eliminated. SIA has not attempted to put a value on those qualitative benefits.

Second, the conversion has presented a number of challenges. And I would just like to point out that those challenges were not caused by decimalization, per se, but by the reduction in the minimum price variation. That reduction in the basic unit of trading was 84 percent, a $\frac{1}{16}$ or $6\frac{1}{4}$ cents down to a penny—84 percent. And that reduction increases the number of trading increments that market participants can use by more than 6 times. It would be akin to the U.S. Senate moving from 100 to 625 Senators to deal with the same set of issues.

When we use the term decimalization, we are really talking about two subjects—the language of decimals itself and the reduction in the minimum price variation of 84 percent. That reduction impacts market mechanics by creating more quotes, more trades, more price movements for traders and systems to handle. Market screens display the same amount of data, but less information. And all else being equal, the trading process must work perhaps 15 to 20 percent harder to accommodate the same dollar result.

The smaller trading increment also impacts trading rules, as you have heard, and these rules impact just about every kind of trade and just about every kind of participant in the market. The increments also impact market making economics by reducing the spread, which is one of the ways that market makers have traditionally been paid for their services. And that changes the behavior of market makers, as well as those who trade with them.

Third, market participants will successfully resolve these issues, in our judgment, through competition, experience, debate, ingenuity, working with the SEC, in the same way that the industry has successfully resolved difficult issues in the past.

Market mechanics issues are the easiest to resolve, such things as volume and better display mechanisms. Trading rule adjustments take longer and market-maker behavior issues will take longer still. We believe that the process of adjustment will be in front of us for many months.

Finally, the SIA believes that the markets are functioning smoothly, having accomplished the conversion without incident. The quality of our markets is as high as it has ever been. Competition has never been healthier.

The industry-wide operations and systems resources have moved on and are now focusing on reengineering the clearance and settlement system and other projects that will further strengthen the safety and soundness of the equity markets for all investors.

Thank your for your attention and I would be happy to respond to questions.

Senator ENZI. Thank you, Mr. Kittell.

Mr. Jenkins.

STATEMENT OF PETER JENKINS, MANAGING DIRECTOR HEAD OF GLOBAL EQUITY TRADING ZURICH SCUDDER INVESTMENTS

Mr. JENKINS. Thank you, Mr. Chairman for this opportunity to testify on decimalization today. My name is Peter Jenkins. I serve as Managing Director and Head of Equity Trading at Zurich Scudder Investments. We manage $400 billion for both individuals and institutions.

I am a trader and I have been a trader for 21 years. I spend a considerable amount of my personal time promoting market efficiency. Today, my goal for being here is to provide you with practical suggestions to achieve this.

As a preliminary comment, I would like to point out that I strongly support the move to decimal pricing in the U.S. securities markets and the trading of securities in minimum increments of one penny. The move to smaller trading increments reduces the spread in securities, which will result in benefits to our shareholders. In addition, the implementation of decimalization has enabled the pricing of securities in the United States to conform with securities markets around the world. Most institutional traders, such as myself, are continually adjusting to this new trading environment and we are already seeing the development of competitive products to help us cope with this change.

Some critics have contended that the problems that market participants are facing since the move to decimalization have arisen solely as a result of that move. I do not believe that is the case.

Instead, I would suggest that many of those problems are the result of the underlying structure of the securities markets on which we trade. Decimalization has simply brought these longstanding issues to the forefront, thereby highlighting the urgency of addressing several unresolved market structure issues. These include the need for the display of meaningful depth a of limit orders by specialists and market makers; and the need for priority rules for ordered entered into the securities markets; and the need to address problems arising from the internalization of orders. I have long advocated that with the move to decimals, we need greater transparency and increased electronic access to the markets.

I should note that most of the difficulties that I have faced since decimalization have occurred while trading on the New York Stock Exchange. In contrast, we have had few such problems when trading securities on the Nasdaq Stock Market, due largely to the fact that electronic communications networks—ECN's—have offered efficient access and have allowed our traders to deal in smaller increments while at the same time have control over our order flow. But to the New York Stock Exchange's credit, they have taken some bold steps to address these emerging market issues, including the implementation of the "Network New York Stock Exchange." However, since the implementation of decimalization on the New York Stock Exchange, the execution of large orders has actually been hampered by the reduced transparency of orders on the exchange limit order book.

The dramatic increase in change of quotes in conjunction with increased instances of market participants stepping ahead of orders by increments of as little as a penny. The net effect has been for the institutional trader to lose control of his or her order flow, since no effective tools exist in the New York Stock Exchange listed market to reach the market efficiently. The "upstairs" trader does not have the time to negotiate trades as quotes change rapidly. This lack of control has led the upstairs trader to expose less to the market for fear of being "front run" for a penny. The result is an increasing amount of order flow has left the Exchange and has been directed to the alternative markets where institutions face less of a risk of having their orders stepped ahead, further fragmenting the listed market.

These problems are not due to decimalization. They result from the fact that the New York Stock Exchange does not provide sufficient protection to the orders that I—and other institutional traders—utilize in trading larger amounts of stock. Today, when an electronic order is sent to the Exchange via Super Dot, the order is first exposed to the brokers on the floor who surround the specialists post prior to actually interacting with the Limit Order book. This technique is called "an attempt at price improvement." If an electronic order is small, it may in fact receive price improvement. If, on the other hand, the electronic order is large, an institutional order, the specialist may first allow the crowd to interact with the limit order prior to execution of the trade.

These hidden orders in the "pockets" of the floor brokers gain standing. When an institution attempts to interact with limit orders on the book, most institutional traders feel this exposure to the crowd is unnecessary. If the upstairs trader were able to interact with the limit order directly without delay, floor brokers might be compelled to make instantaneous decisions and not use limit orders as options. In order to resolve these problems, institutions must have facilities for the automatic execution of large orders on the Exchange and the ability to trade large orders without subjecting these orders to the price improvement mechanisms.

The New York Stock Exchange's new system, "Institutional Xpress," does offer some solutions. But here's the problems with Xpress. Orders do not become expressible until it is on the best bid or offer for a time period of 30 seconds. This should be changed, to enhance efficiency, there should be no time limit. Institutional Xpress also requires that an order be at least 25,000 shares in size—this number is too high. Institutional Xpress should be able to react through the offer to get to the available liquidity pool.

These large orders eligible for execution in that system should not be permitted to be represented by specialists to the crowd on the floor of the Exchange. The New York Stock Exchange has the opportunity to promote the placement of limit orders on the book by providing protection for, and rewarding the placement of, those orders and attracting order flow. These improvements that I suggest will serve to increase the depth and liquidity of the market. Greater transparency, along with greater liquidity, will benefit our investors to enabling them to get a more effective execution.

In closing, I want to stress that I have worked with the New York Stock Exchange and other exchanges, as well as the Investment Company Institute directly for many years to voice my opinions, along with those of my competitors, on how best to provide institutions the liquidity we need to perform effectively on behalf of our clients' portfolios. These changes I suggest do not pose a threat to the New York Stock Exchange. In fact, these enhancements will offer the ability for both institutions and retail participants to transact more efficiently and at the best price.

Thank you.

Senator ENZI. Thank you.

Mr. Fagenson.

STATEMENT OF ROBERT B. FAGENSON VICE CHAIRMAN, VAN DER MOOLEN SPECIALISTS USA, LLC VICE CHAIRMAN, THE SPECIALIST ASSOCIATION OF THE NYSE

Mr. FAGENSON. Chairman Enzi, thank you for having me here today. I am Vice Chairman of Van der Moolen Specialists, one of the largest specialist firms on the floor of the Stock Exchange. I am also Vice Chairman of the Stock Exchange Specialist Association. So I am really here today representing the 480 men and women who are the specialists who do make the markets on the floor of the New York Stock Exchange.

In 1997, the House introduced a bill called The Common Cents Pricing Act, and I had the opportunity to testify before the Subcommittee on Finance and Hazardous Materials, known as "cash and trash." We made several points there and, quite frankly, they have all come true.

Reduced minimum trading increments from 12½ cents to 6¼ cents to a penny, are really down more than 90 percent now, and they are easier to understand. We said that this would reduce payment for order flow, which distorts the markets, where brokers send their orders to dealers who pay them for them, and perhaps, to a certain extent, ignore their fiduciary responsibility. This has been reduced, but it hasn't been eliminated.

We felt this would hurt the regionals' ability to compete and, at this point, we think it has. And we fear that the Philadelphia Stock Exchange's equity business may, in fact, be in jeopardy.

This would certainly create the ability for market participants to price improve or step ahead, depending upon the terminology you would use, for one penny. That certainly has happened, and also that the market would get cluttered with a tremendous number of meaningless flashing quotes and liquidity would be harder to find, although it was still there.

Now all this has come to pass and it was not because we are geniuses and we had some crystal ball. But we do do this for a living and after 30 years on the floor, I can tell you that none of this was unexpected.

We suffered a shock to the system, despite the fact that, technically, we were all prepared and the SEC made sure that we were, and the SRO's did a good job.

It is the equivalent of traveling the same road to work every day for 30 years and it was 10 miles long, and there were eight traffic lights. And suddenly, one day, there were 16. It would be a bit more difficult, but it wouldn't be a tremendously noticeable change.

Then one day, you woke up and there were a hundred lights on that same 10 mile stretch. Some were green, some were red, and some were yellow. So you had to stop some places and some places you did not, and every day, it changed.

You knew the road really well and you were going to get to the other end, and it was a pretty safe travel. But it probably took a little longer, and the end and the time it would take was probably somewhat more obscured. And this, despite the fact that you were dealing in increments that were given to greater clarity.

The participants all had to relearn how to do certain things. We had to develop new systems and the New York Stock Exchange has been moving aggressively to do that.

What Cathy Kinney mentioned in terms of depth indications, depth conditions, the use of enhanced hand-held electronic devices to transmit information, and a look at the book that would allow investors to see a hundred price points, are certainly things that are going to move toward making this transition a lot smoother.

It is almost like the equivalent of installing radar or sonar on your car as you traverse that road. It just lets you see out a little bit further so that you know exactly what is coming up.

We are a lot busier on the floor. There are a tremendous number of quotes. A lot more trades per order. A 500- or a 1,000-share order that used to get executed in one transaction, now may take two or three. These are just the realities that we have to deal with. Spreads are narrower, clearly, but the sizes at those reduced spreads are smaller.

There are many inaccessible quotes that create tremendous frustrations, not just for Peter, but for all investors, large and small. I do not want you to confuse spreads with liquidity. Spreads have narrowed, but liquidity most likely is pretty much the same. It just is somewhat more obscured and a little bit harder to access. But we are working on that.

Price discovery certainly has slowed. It is almost the equivalent of trying to buy a house and negotiating in $100 increments. That may take a little bit longer than the way it is normally done.

The ability to narrow quotes to a penny caused a tremendous upheaval. The phrase pennying was coined. Suddenly, there was a tremendous amount of finger-pointing. The specialists were blamed for all of it. We were unprepared for the result.

But the statistics are proving that it is the professional traders, day traders, and floor brokers representing financial institutions that are in fact taking advantage of this ability to get a better price for their customer in increments as small as a penny.

Yesterday, I learned of a new trading program that was developed to watch for quotes that are somewhat larger than average and automatically enter orders for a thousand or two thousand shares, a penny below or a penny above, just to try and take advantage of a perceived opportunity. But brokers are learning, both upstairs, off the floor, and downstairs, how to accommodate.

If a market in Black Hills Power were 57 bid, offered at 57 and 25 cents, and that became narrowed to 57.10 bid and 57.15 offered, limit orders are now being entered to buy at prices higher than that lower offer, to bid through it and access the liquidity that is hidden above, and sell orders lower than the posted bid to access those buy orders below the posted bid, down to the point where that seller is willing to sell. Brokers on the floor are being given greater discretion, so they can access liquidity where they find it, and not having to run back to the phone every 2 minutes to ask for additional instructions.

Mr. Chairman, we have the most powerful liquidity pool the world has ever known and it is intact and it is working just fine. We are still the envy of the world. We have increased the clarity and we are moving to solve our problems. But let us not forget why we did it.

We did it to create a system that was more customer-friendly. With trading increments reduced 90 percent and in dollars and cents, we are essentially there. But there is a great threat that looms. We could lose the very clarity that we have all fought so hard to try and create.

If we permit subpenny trading to proliferate, trading in hundredths of a penny, in thousandths of a penny, we will destroy the ability to access liquidity. We went from saying that 10.125 was difficult to understand and 10.0625 is more difficult. So we said 10.05 sounds fine. Are we now to say that we bought something at 10.0237, is that better? When was the last time you walked into a supermarket and asked for 1.537 pounds of ham?

We have created a system that is efficient, effective, and understandable. Do we really want to create the equivalent of an impressionist art auction where bids go up a hundred dollars at a time? The buyers and sellers would be dead before the auction is over. Public confidence is hard to build and easy to destroy. We have to continue to design our systems for investors, not for practitioners.

Just because we can do it, doesn't mean we ought to do it. And our industry, sometimes has acted in the reverse. As we look at rules such as the short-selling rule, let us take a hard look. But let us not forget that issuers and the public like some of these and before we change them, let us make sure we get their opinions.

Subpenny trading can undo all the good we have accomplished. We call on you to go past what the SEC would suggest, which is study of this issue, and pass legislation that prevents the minimum increment nationally from moving below a penny unless we all decide that it is the right thing to do.

The road to work may take a little bit longer to get there under certain circumstances, but let us not risk creating a gridlock that destroys the system we have worked so hard to build that we cannot undo.

Thank you.

Senator ENZI. Thank you very much.

I want to thank all of you for your excellent testimony, not only the great job you did of convincing and summarizing here, but also the more extensive testimony. From my standpoint, I appreciate the way that you kept it simple and clear. Many of us do not have the depth of understanding or experience that you have acquired in your years of dealing with this. And, of course, one of our tasks, is to take what you told us and put it in terms that our constituents can understand, who are often confused and sometimes upset when they are talking to us. So I do appreciate your effort and the tremendous job that you did.

To start the questioning, do any of you who spoke at the beginning have anything that you would like to comment on as a result of what has been said? And then those who testified later can say something about what they are saying now. Are there any additional comments based on the additional testimony?

[No response.]

I saw some note-taking up there at the desk, so I thought there might be.

One of the reasons that we are holding this hearing today is because there have been numerous complaints about orders, particularly large orders, being stepped ahead by specialists and floor brokers. I do realize that there is the flip side to that, where there is some receiving of price improvement. Can you tell me what this effect is going to have on the small investor. Anyone?

Mr. FAGENSON. Well, the small investor who is buying in 100-, 200-, 300-share lots has probably benefited the most from the change to decimal pricing because those small quotes that are created either by computer programs or other retail orders are usually in the size that the smaller investor is buying or selling. And at that narrower spread, they are probably saving some money.

The greater frustration comes in for institutional investors such as Peter Jenkins, who has to deal in 100,000-, 200,000-, and 500,000-share lots, and how do they find that liquidity? And that has become somewhat more of a task.

So the small investor probably is having a better time and is probably reaping the greatest benefit. But once you get above that 200- or 300-share lot, it becomes a lot less clear. And in fact, they may be paying more in certain circumstances.

Mr. JENKINS. I would add one thing. Zurich Scudder manages mutual funds and we have to remember that we represent thousands of individual retail mutual fund shareholders. My costs, if they are increasing, are affecting the retail. We need not forget that. It is not only the individual that comes direct to the Exchanges, the retail broker, but also the mutual fund shareholders as well.

Senator ENZI. Excellent point. Anyone else?

Mr. Pasternak.

Mr. PASTERNAK. I think, just to take you back in history to illustrate, about 5 years ago, an individual investor who was trading on-line, let us say at the birth of the Internet in 1995, he could buy 5,000 shares of virtually any Nasdaq stock, for instance, at the NBBO—the National Best Bid and Offer—the spread was generally an eighth or better or wider, for about $40.

By about 1998, 1999, the price of that transaction had gone down to about $9 or $10 on the commission side. But the auto-exsize had gone down to 2,000.

Just to show you the tenuous balance between that proposition, over 95 percent of all orders were still automatically executing. And generally speaking, depending on how you define individual investor orders, a large proportion—I do not have a stat right here—but I would say at least 90 percent of all investors, individual investors, units of trading, are 2,000 shares or less meaning the marketplace was providing liquidity at the national best bid and offer the vast majority of the time. Today, under decimal pricing, that is occurring in our environment less than 50 percent of the time.

I think Mr. Jenkins made a statement about the NBBO having some relevance in two cases. In the case, to make an assessment of how to proceed with a strategy to trade. And second, from a small individual investor. I would define it as 2,000 shares or less.

Should there be a sense, a high sense of confidence that I can buy or sell, and even lower that to 1,000 shares of virtually any security in the United States at a price that I am seeing? If that sense of confidence is not there, then in fact what use is a pricing stream that includes a National Best Bid and Offer if most Americans cannot effect the transaction at that price?

Senator ENZI. Mr. Campbell.

Mr. CAMPBELL. It is clear that in terms of the display depth on Nasdaq is about one-third of what it was in a 16th environment.

The real question is, moving from 6¼ pennies and then putting it in comparison to penny increments as opposed to 16th, is the depth through that roughly the equivalent of what it was when it was in the 16th increment? Having been at this for 7 weeks, and having our display depth about a third of what it was prior in a fraction environment, I think right now, it is still premature for us to be able to come out and say, okay, this is exactly what is happening, and watching it migrate to some point in time where we really have statistical evidence as opposed to anecdotal.

Senator ENZI. Mr. Fagenson.

Mr. FAGENSON. Mr. Chairman, historically, whenever we have increased the flow of information to investors, the market has grown. Whenever we have enhanced the quality of the information, the market has grown.

The challenge is to make sure that we can have investors see not just the NBBO, but where liquidity resides. And we are moving in that direction by opening up the specialist book and by offering these depth indicators.

That is really one of the keys. And in terms of Institutional Xpress, a system that Peter spent some time explaining, I would only say, if you understand it now, you ought to come to the New York Stock Exchange and take over because it is a complex system, and I was one of the people who helped design it and I still find it complex. But we did design it and we continue to enhance it, and we will, to give just the type of institutional access that Peter is talking about. And hopefully, over time, it will prove to be a system that works well. We want all investors, small and large, to have the best information. And the systems that provide that will continue to serve to expand the market.

Ms. KINNEY. Chairman Enzi, I think one of the issues that we raised in our testimony and one that is important to the Exchange is this issue of ensuring that both Congress and the SEC look at the issue of the MPV and not allow the minimum price variation to go below a penny. I think a number of the issues that have been raised here, whether it is reduced depth or whether it is reduced transparency, will all be exacerbated if the markets go below one penny as the minimum price variation.

We would all agree here that individual investors who are buying 500 shares of IBM, or those that are buying 500 shares of Microsoft, are certainly getting better prices, when you look at what is driving the markets and the institutional interest in the markets, as well as individuals who are buying larger numbers of shares, you have to be concerned about some of the impacts that you have seen. And they certainly are impacts that we have seen before.

A study has just come out by two economists looking back over the experience of moving from eighths to sixteenths. And they have concluded that simply having spreads narrow is not a good indicator of cost of execution. We just draw that to your attention as well and try to balance this issue across a variety of investors who are involved in the markets.

Senator ENZI. Thank you.

One of the things that Congress does is step in the middle of things occasionally. The purpose of this hearing was not to do that. It was to get some very basic information on a system that changed relatively recently—very recently—to see if any problems were cropping up yet that we would begin to hear about. Of course, we would hope that you, in cooperation with the SEC, would make the necessary changes and it wouldn't ever become a legislative responsibility.

In regard to the SEC, does the decimal implementation change the necessity of certain regulations, such as the short-sale rule or the trade-through rule? Are there things pending there now that do not need to be done and some that do need to be done that maybe are not being considered?

Mr. Fagenson.

Mr. FAGENSON. I think we have to make sure that we do not think about every stock trading the same way. Stocks trade differently. Your hundred most active stocks are going to trade far differently than your hundred least active stocks.

There are all sorts of variations in the middle. And while eliminating the short-sale rule in your top one hundred stocks might crate additional liquidity, it might create havoc and market manipulation in less liquid stocks. So this is really an issue that I think requires tremendous study.

If you ask issuers and you ask small customers whether they take comfort in a rule such as the short-sale rule, I think, universally, they would probably say yes. But before we upset that delicate balance, I think we have to make sure that the perceived benefit is really there before we destroy this element of public confidence that I think is an important piece of the market framework.

Senator ENZI. Mr. Campbell.

Mr. CAMPBELL. Mr. Chairman, we have submitted rules to reflect the new structure and the trading environment that we are in to address the changes brought about by decimalization.

My only concern is that the SEC opines on the short-sale rule prior to an adequate time to evaluate as we are doing our new experience with about 7 weeks of history behind us in a decimal environment. Our concern is that it is well thought out, that it is adequately discussed, and the empirical evidence is there to be able to make an important judgment call as we start modifying the rules in a new market environment.

I do agree that there are some very important attributes of short-sale rule that are very important to a lot of people.

Our only concern is that we have the right debate with the right information at the appropriate time when the empirical evidence is available, and it is not today.

Senator ENZI. Anyone else wish to comment on that?

[No response.]

The foreign markets have been decimalized for a longer time than we have, they have probably been dealing with some of the problems that we have discussed, such as the shrinking limit orders and stepping in front. How are they handling it? Or are they worrying about it at all?

Mr. Jenkins.

Mr. JENKINS. I think in the foreign markets, they have stressed time and price priority and connectivity. And I think that is the way they are dealing with a lot of these problems.

Clearly, they have their problems as well. But priority of order placement is important, or a little bit more important, in the international markets.

Mr. KITTELL. Also, in the case of some international markets, the minimum price variation varies by the price of the stock.

So that a $100 stock would have a higher minimum price variation than a $10 stock. And there will be a schedule of four or five minimum price variations up and down the price scale.

We have that in the United States here in the case of options trading, where the options priced below $3 trade at the moment in 5 cent increments, and over $3 trade in 10 cent increments.

Mr. PASTERNAK. Just two comments. We do have operations in Europe and Japan and we are active in those markets. We do have a perspective—it is a real-time perspective. You could make a few observations about the foreign markets.

First is that the individual investor is not as far along as he is in the United States. So there is still a very heavily institutional market that is in almost every market in the world.

Second, that their markets are behind our markets and we are the envy of every market in the world when it comes to liquidity, price discovery, and what I call liquidity provider participation. And finding that sweet spot between rewarding price discovery—I think Mr. Jenkins has an excellent point about incentivizing and eliminating people from coopting your information and rewarding you properly.

Markets have to take that head on and find a balance between that and people who are bringing liquidity, capital and expertise to the market, liquidating both block trades for institutions, providing knowledge for institutions, and liquidating individual investor transactions. The foreign markets have not reconciled that and there is no culture whatsoever of capital commitment and immediacy for individual investors in virtually every market in the world, except for ours. As we look forward, we should protect what we have and keep refining it, but not to think that our markets are second to each, but certainly respect innovation, even if it comes from around the world.

Mr. FAGENSON. We make markets in Germany, Great Britain, Amsterdam and here in the States. We were the largest specialist on the Amsterdam Stock Exchange for many, many years. We still are, although they are doing away with the specialist system. These markets are far smaller than we are. As Ken just said, they take absolutely no notice or concern for the individual investor.

I mean, the big bang in London was the sound of the small investor getting whacked over the head. They bifurcated that market into wholesale and retail so that they could hide what they were doing in size transactions and in not any way demonstrate what the true price was. Price discovery went on behind closed doors. So they have been doing it longer, but that is just made them more expert at hiding things.

Senator ENZI. Mr. Campbell.

Mr. CAMPBELL. Mr. Chairman, I think the one thing that everybody at this panel has really pushed very hard in everything the capital markets, the United States, does today is transparency.

Most foreign markets have solved their decimal issues by lack of transparency. And as we continue to balance as much information that we can provide for the benefit of the investor, that is part of what we are all trying to do in the most sincere way we know how. Most foreign markets have gone the other way. You cannot see what the problems are because they do not allow you to.

Senator ENZI. Anyone else?

[No response.]

I am glad that I asked that last question because it is not often in the Banking Committee when we are dealing with securities or accounting issues and those sorts of things, that you get that feeling of patriotism, and how great it is in the United States.

[Laughter.]

Every one of you reflected how we have it better in the United States. Of course, that is what this Committee wants to make sure happens, that that same thing continues as we become kind of a clearinghouse for complaints, mostly from constituents.

I think the view of the Committee is that the decimalization has gone well and that life is good in the United States. Some of the things that you mentioned may be more of an effect of the economy than the decimalization process. And we want to keep a careful eye on that.

I do have a series of questions for each of you. But I will submit those to you and would appreciate your answers. And then, when I get the answers, I will circulate both the questions and the answers to my colleagues. And we will be doing some summaries of what you said and emphasizing those a little bit, too. Of course, they will be from my perspective because I am the one here.

[Laughter.]

So I do appreciate your participation today and all of your help. We will be calling on you again. Thank you very much.

Ms. KINNEY. Thank you very much.

Mr. CAMPBELL. Thank you.

Mr. JENKINS. Thank you very much.

Senator ENZI. The hearing is adjourned.

[Whereupon, at 11:20 a.m., the hearing was adjourned.]

[Prepared statements and response to written questions for the record follow:]

PREPARED STATEMENT OF LAURA S. UNGER

ACTING CHAIRMAN, U.S. SECURITIES AND EXCHANGE COMMISSION

MAY 24, 2001

Chairman Enzi, Ranking Member Dodd, and Members of the Subcommittee:

I am pleased to testify today on behalf of the Securities and Exchange Commission ("Commission" or "SEC") concerning the recent conversion of quotations in equity securities and options from fractional to decimal pricing and the effects that this change has had on market dynamics and trading behavior. I would particularly like to address not only the benefits of decimalization, but also some aspects of this historic change that could affect the transparency, liquidity, and fairness of our markets.

I. Introduction

As you know, under Congress' leadership, over the past year the U.S. markets have moved from pricing shares in fractions to pricing shares in dollars and cents—the same pricing used in virtually all other aspects of the economy. The goal of decimalization was viewed as necessary to simplify pricing for investors and to make our markets more competitive internationally. Many proponents of decimalization also hoped that decimal prices would ultimately reduce trading costs for investors by, among other things, permitting quotation spreads (the difference between the highest bid quotation and the lowest offer quotation) to narrow from the 1⁄16 minimum increment that was standard in the fractional environment.

Over the last year, the Commission has sought to ensure that the conversion to decimal pricing was accomplished in as rapid but orderly a manner as possible. On June 8, 2000, we issued an order directing the securities exchanges and the Nasdaq Stock Market ("Nasdaq") to phase-in decimal pricing beginning no later than September 5, 2000, and ending no later than April 9, 2001.[1] As a result of the careful planning, preparation, and coordination among regulators, the markets, clearing agencies, vendors, and the securities industry, I am able to report that the phasing-in of decimal pricing was completed on schedule and without significant operational problems or trading disruptions.

While comprehensive analyses of the market effects of decimalization are not yet available, preliminary reviews by the Commission's Office of Economic Analysis ("OEA") and Nasdaq indicate that at least some of the anticipated benefits of decimalization, such as the significant narrowing of quotation spreads, are already evident. For example, OEA estimates that, from December 2000 to March 2001, quotation spreads in securities listed on the New York Stock Exchange ("NYSE") narrowed an average of 37 percent, and effective spreads narrowed 15 percent.[2] An even more dramatic reduction in quotation spreads was observed in Nasdaq securities, with spreads narrowing an average of 50 percent following decimalization, and effective spreads narrowing almost as much. While it is difficult, at this time, to formulate accurate estimates of the extent to which investors may have benefited from decimalization, the overall narrowing of spreads makes it likely that investors entering small orders that are executed at or within the quotes have experienced reduced trading costs.

In addition, preliminary studies by Nasdaq indicate that, despite the concerns previously raised by some market commentators, decimal pricing has not expanded quotation traffic or exacerbated capacity demands to the extent anticipated. Although there is some evidence that the number of quotation updates has increased, the fears that decimalized quotes would cause reporting backlogs and outages appear to have been unfounded.

Nevertheless, the Commission has long recognized that the shift from fractional to decimal prices had the potential to influence market dynamics and trading behavior in ways that could affect the transparency, liquidity, and fairness of the markets. When ordering the decimal conversion last June, therefore, the Commission required the markets to carefully phase-in this process in order to provide regulators and market participants opportunities to observe how decimalization worked in practice. The Commission hosted a roundtable on December 11, 2000 to solicit viewpoints on how the early phases of decimalization were affecting markets and trading. Moreover, our June 8, 2000 decimals order required the markets to conduct their own studies within a few months of the full implementation of decimal pricing on April 9, 2001 that would analyze how the conversion had affected systems capac-

[1] See Securities Exchange Act Release No. 42914 (June 8, 2000), 65 FR 38010 (June 19, 2000).

[2] The effective spread measures the cost of trading by comparing the execution price of a trade with the current mid-point of the quoted spread. Since trades sometimes occur at prices that are better than the posted quotes, the effective spread measure captures this "improved pricing."

ity, liquidity, and trading behavior. In view of the complexity of some of the issues that have been raised concerning decimal pricing, the Commission has extended the deadline for the markets' studies to September 10, 2001.[3] In the meantime, we are continuing to work with the markets and market participants to identify any aspects of decimalization that might compromise the fair and orderly operation of the securities markets.

Today, I would like to focus on how decimalization has affected market transparency and liquidity, as well as key investor protection and market integrity rules of the Commission and the self-regulatory organizations ("SRO's").

II. Effects on Market Transparency and Liquidity

Market transparency—the dissemination of meaningful quote and trade information—assists investors in making informed order entry decisions and enables broker-dealers to meet their best execution duties for their customer orders. Moreover, market transparency plays an essential role in linking dispersed markets and improving the price discovery, fairness, competitiveness, and attractiveness of U.S markets. Currently, the quotes and trade reports from all registered exchanges and Nasdaq are published on a consolidated basis to vendors, brokers, and customers worldwide.

Decimal pricing presumably has enhanced the ability of investors to understand the consolidated quotations of competing market centers. Investors can now easily compare prices to buy and sell stocks in dollars and cents without having to deal with prices in fractions. Nevertheless, we recognize that, as the minimum quoting increment has narrowed to a penny, the market depth at any particular price level (that is, the number of shares available at the published bid or offer) has decreased as well. For example, OEA has estimated that quote sizes in NYSE-listed securities have been reduced an average of 60 percent since the conversion to decimals and preliminary analyses of Nasdaq securities show a 68 percent reduction in quote sizes. Some firms and institutional investors also have expressed concerns that the reduction in quoted market depth may be adversely affecting their ability to execute large orders.[4] In particular, market participants have indicated that smaller trading and quoting increments have increased the risk of displaying limit orders, particularly larger limit orders, leading to a reduction in the amount of liquidity provided by such orders. In an effort to provide more information about available liquidity, the NYSE recently proposed, and the Commission approved on an accelerated basis, a rule to disseminate "depth indications" and "depth conditions" to reflect market interest in a security below the published bid and above the published offer.[5]

We recognize, however, that these measures alone are unlikely to address market participants' liquidity concerns in a decimal environment. We have asked the markets to evaluate these concerns in their reports to the Commission, and we will work with the markets and the securities industry to identify and address any negative effects from decimalization on overall market transparency and liquidity.

III. Investor Protection and Market Integrity

We recognize that decimal pricing also raises a number of issues regarding vital investor protection and market integrity rules of the Commission and the SROs that depend on price changes or differentials. I will briefly mention two examples.

Customer Limit Order Protection Rules

Investors use two main types of orders to buy securities: market orders and limit orders. When a customer uses a market order, a broker will execute the order in the market at the best price available. When a customer uses a limit order, a broker is required to obtain an execution at the limit price or better. By submitting a limit order, the customer competes for a better price than the market is offering, or limits the price that the investor will accept. As a result, limit orders provide liquidity to those who demand immediate execution. Limit orders are a very important source of price information and market liquidity in the equity markets. When customers

[3] The difficulties inherent in conducting useful analyses of the effects of decimalization in such a short time frame were also discussed in a letter from the American Stock Exchange ("Amex") requesting an extension of the June 8, 2001 deadline for decimalization studies. See letter to Annette Nazareth, Director, Division of Market Regulation, from Peter Quick, Amex President, dated May 9, 2001. The Commission has decided to extend the study deadline not only for the Amex, but also for the other securities exchanges and the NASD.

[4] See letter to Richard A. Grasso, Chairman, New York Stock Exchange, Inc., from Craig S. Tyle, General Counsel, Investment Company Institute, dated March 11, 2001.

[5] See Securities Exchange Act Release No. 44084 (March 16, 2001), 66 FR 16307 (March 23, 2001) (NYSE Rule 60). The Commission's Advisory Committee on Market Information is also considering a range of market transparency issues.

submit limit orders, they are held by a specialist or market maker until the orders are executed, they expire, or are cancelled. Because they collect these limit orders submitted by customers, specialists and market makers may obtain informational and trading advantages. Commission and SRO rules protect customer limit orders by providing them with priority over specialist and market maker proprietary orders at the same price on the exchanges and on Nasdaq.[6] However, specialists and market makers can "step ahead" of customer limit orders by trading at a price better than the existing limit order.[7]

With some variations, the rules of the NYSE and the NASD require that a specialist or market maker who wants to "step ahead" of a customer limit order pay a price which is greater than the limit order by at least the minimum quoting increment.[8] However, with the conversion to decimals, the minimum price increment has decreased from 1⁄16, or 6.25 cents, to 1 cent. This means that it could be less costly for specialists, market makers, and possibly certain other market participants to profit from their knowledge of limit order flow by trading ahead of limit orders for only a penny a share.[9] Public traders may defend themselves from such stepping ahead practices by using floor brokers to hide their orders, by breaking up their orders, and by switching to market order strategies from limit order strategies. These responses could increase transaction costs and reduce market transparency.

Since the commencement of decimals trading, numerous articles have appeared in the press that have raised concerns about increased stepping ahead activity. In addition, the NYSE held a meeting on February 16, 2001 with a cross-section of market participants to discuss several issues related to decimal trading—including "stepping ahead." The NYSE reported after the meeting that while it believed that some of the problems associated with decimals may be behaviorally solved, some other issues might need to be addressed systemically, and has organized committees to examine these issues and develop possible solutions.

The Commission currently is gathering information about the operation of these investor protection rules in the decimal environment, and will consider whether action is necessary to protect investors.

Short Sale Regulation

A short sale is the sale of a security that the seller does not own or that the seller owns but does not deliver.[10] In general, short selling is utilized to profit from an expected downward price movement, or to hedge the risk of a long position in the same security or in a related security.

Commission Rule 10a–1 is designed to restrict short selling in a declining market. The rule applies to short sales in any security registered on a national securities exchange, and uses a "tick test," which means that a short sale generally must be

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[6] Exchange Act Rule 11a1–I (T) requires Exchange members to grant priority to any bid or offer at the same price for the account of a person who is not a member. NYSE Rule 92(b) prohibits NYSE members from trading for their own account at the same price as an unexecuted customer limit order. The NASD's Manning Rule similarly requires the execution of a customer limit order upon the execution of a proprietary trade at a price that would satisfy the customer limit order. *See* NASD IM–2110–2—Trading Ahead of Customer Limit Order.

[7] It should be noted that when a specialist or market maker "steps ahead" of a limit order, it provides "price improvement" to the execution on the contra side of the trade. For example, assume that a customer limit order is sent to a specialist or market maker to buy 100 shares of XYZ stock at $10 per share for a total of $1,000. The specialist or market maker may decide to "step-ahead" of the customer limit order and trade with a customer order to sell the security. While the customer buy order would remain unfilled in this situation, the customer sell order would receive a price from the specialist or market maker that is better than it would have received from an execution with the customer buy order.

[8] NYSE Rule 92(b) establishes a defacto "stepping-ahead" increment based on the NYSE's minimum trading and quoting increment. That increment is currently a penny for most securities. The NASD's Manning Interpretation requires market makers who want to trade ahead of customer limit orders to trade at a price $0.01 better than the customer limit order priced at or better than the inside market. For customer limit orders priced outside the inside market, a market maker must trade at a price at least equal to the next superior minimum quotation increment. *See* Securities Exchange Act Release No. 44165 (April 6, 2001) 66 FR 19268 (order approving Nasdaq proposed rule change to the Manning Interpretation adopting a $0.01 price improvement standard for securities quoting in decimals.)

[9] For example, assume that a public limit order is entered to buy 100 shares of XYZ stock at $10 per share for a total of $1,000. Under fractions, with a minimum price increment of 1⁄16 a specialist or market maker could trade ahead of the customer buy order by executing at $10 1⁄16 per share, for a total of $1,006.25. With the decimals minimum price increment of a penny, it is possible that the specialist or market maker could "step-ahead" of the customer order by paying $10.01 per share for a total cost of $1,001 to buy 100 shares, an 84 percent reduction in the "stepping-ahead" cost.

[10] *See* Rule 3b–3 under the Exchange Act, 17 CFR 240.3b–3.

at a price higher than the last reported sale for the security. [11] The NASD also has a short sale rule for Nasdaq securities that requires a short sale to be effected at a price above the current bid in a declining market.[12] In a decimals environment, where price differences between trades can be a penny or less, the question is: *how much* above the last sale or the bid must a short sale be?

On March 2, 2001, the Commission took a step toward answering this question when we approved a change to the NASD short sale rule providing that a "legal" short sale must be executed at a price at least $0.01 above the current best bid.[13] In approving this amendment on a one-year pilot basis, we noted that transactions based on very small price changes could undermine the operation of the short sale rules. While permitting a $0.01 increment standard for short sales during the initial stages of the conversion to decimal pricing, we required Nasdaq to submit a study analyzing the operation of the amended rule.[14]

Essentially the same question arises in the context of the Commission's short sale rule. In addition to our ongoing review of the short sale rule, which was begun in our concept release in October 1999,[15] the Commission's staff is gathering data and is considering rule changes to address short selling in a decimals environment.

IV. Subpenny Trading

Many of the regulatory issues that have arisen in a decimal environment may be exacerbated by the practice of trading at increments finer than $0.01, commonly referred to as subpenny trading. For years, some electronic communication networks ("ECN's") and Nasdaq market makers have permitted trading in increments smaller than that displayed through the Nasdaq system. This practice has continued in the decimal environment, with approximately 4 to 6 percent of trades in Nasdaq securities executed in subpenny increments even though the quotations for these securities are at a penny increment. On April 6, 2001, the Commission approved, on a pilot basis, a rule filed by the NASD specifying the protections Nasdaq market makers must provide to customer limit orders priced in subpennies.[16] As noted earlier, the NASD's Manning Interpretation requires the execution of a customer limit order held by a market maker if the market maker trades for its own account at a price that would satisfy the customer limit order.[17] The market maker, however, can trade for its own account at a price better than the customer limit order and is not obligated to execute the limit order (so-called "trading ahead"). The amendment to the Interpretation requires market makers who want to trade ahead of customer limit orders to trade at a price at least $0.01 better than the customer limit order priced at or better than (inside) the best displayed inside market. For customer limit orders priced outside the best displayed inside market, a market maker must trade at a price at least equal to the next superior minimum quotation increment. Because subpennies increase the concerns raised by decimal trading, the Commission needs to consider the impact of subpenny trading on market transparency and liquidity, as well as investor protection and market integrity rules.

V. Conclusion

The conversion to decimals went smoothly from an operational standpoint, thanks to the planning and cooperation among regulators, self-regulators, and the industry. Decimal trading has raised issues that must be carefully considered to ensure our markets remain transparent, liquid, and fair. As other market challenges have arisen over time, the Commission has embraced these challenges, working to adapt regulatory structures in a manner that will affirm investor confidence and help to lead our markets into the future. We believe that the conversion to decimals fosters these

[11] 17 CFR 240.10a–1.

[12] NASD Rule 3350 prohibits short sales by NASD members in NMS securities at or below the current best (inside) bid as shown on the Nasdaq screen when that bid is lower than the previous best (inside) bid (commonly referred to as the "bid test"). Rule 3350 contains certain exemptions, including an exemption for qualified Nasdaq market makers, options market makers, and warrant market makers. The Rule also contains exceptions similar to those provided under Rule 10a–1.

[13] *See* Securities Exchange Release No. 44030 (March 2, 2001) 66 FR 14235 (March 9, 2001).

[14] The Nasdaq study is due on December 1, 2001.

[15] Securities Exchange Release No. 42037 (October 20, 1999) 64 FR 57996 (October 28, 1999).

[16] Securities Exchange Act Release No. 44165 (April 6, 2001), 66 FR 19268. The Commission also approved on April 6, 2001, a pilot program setting forth protections that must be provided by specialists and market makers on the Chicago Stock Exchange("CHX") for customer subpenny orders in Nasdaq securities. Securities Exchange Act Release No. 44164 (April 6, 2001), 66 FR 19263 (April 13, 2001). The Nasdaq and CHX proposals were approved as pilot programs until July 9, 2001, during which time the markets will supply the Commission staff with monthly reports on their activity in subpenny increments.

[17] See text at n. 6, above; NASD IM–3220–2—Trading Ahead of Customer Limit Order.

goals by simplifying pricing and making our markets more competitive internationally. We recognize, however, that there are some aspects of the effects of decimalization that still need to be considered thoroughly. I want to assure you that the Commission is working with the markets and the securities industry to address potential problems while preserving the benefits of decimalization. We appreciate the Subcommittee's continuing interest in this issue and the role it has played in helping to ensure a smooth transition to decimals.

Thank you.

The American Stock Exchange®
An NASD Company

Peter Quick
President

May 25, 2001

The Honorable Michael B. Enzi
Chairman, Subcommittee on
Securities and Investment
Senate Committee on Banking,
Housing and Urban Affairs
534 Dirksen
Washington, DC 20510

Re: Subcommittee on Securities and Investment
Hearing on the Implementation and Future of Decimalized Markets
May 24, 2001

Dear Chairman Enzi:

As you know, the SEC's Order Directing the Exchanges and NASD to Submit a Phase-In Plan to Implement Decimal Pricing In Equity Securities and Options[1] required the exchanges and the NASD to submit their final decimalization studies by June 8, 2001, or slightly less than 8 weeks after the industry finished the conversion to decimals pricing. The exchanges proposed rule changes setting minimum price variations were due to the SEC by July 9, 2001. Further, as explained by the SEC at an SIA Decimalization meeting, the exchanges were to use this final report as the basis upon which they proposed any other fundamental market structure changes they believed were needed as a result of the transition to decimal pricing.

The Amex felt strongly that the 8 week period was an insufficient amount of time from which to draw meaningful, insightful conclusions on how decimalization has affected the capital markets. Accordingly, on May 9, 2001 the Amex respectfully requested that the SEC extend the June 8 deadline to September 10, 2001. On Tuesday, May 22, the SEC informed us that our request had been granted and would also apply to all equities and options exchanges. We greatly appreciate the SEC's willingness to accommodate this request and intend to seize this opportunity to prepare a meaningful, thorough study on

[1] Release No. 34-42914; June 8, 2000

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how decimalization has impacted retail and institutional investors as well as professional market participants, such as specialists and market makers.

The Amex is the only exchange in the United States that serves as a primary market and substantial liquidity provider in three distinct investment vehicles—equities, options, and exchange-traded funds. Currently, Amex holds the dominant position in the highly popular exchange-traded fund market and ranks a strong second in the standardized equities options market with approximately 31% of the market share[2]. Our equities business serves a niche market for small to mid cap companies pursuing growth strategies. In this market, Amex commands approximately 75% of the order flow. Further, a healthy mix of both retail and institutional investors comprise our customer base. As a result, we are uniquely positioned to assess from a balanced perspective the impacts decimalization is having on our capital markets.

The Amex is now working to identify the criteria that will best elucidate decimalization's affects on market quality and investors for each of our product lines—equities, options, and exchange-traded funds. To assist us in developing a meaningful, final report on decimalization, we have engaged an outside consulting firm that is well versed in the industry's transition to decimal pricing. Further, to ensure we undertake a complete and accurate analysis of appropriate criteria that clearly identify any market structure changes that may be necessary to maintain fair and orderly trading and to bring a broader perspective to our efforts, the Amex has created a special decimalization committee composed of five distinguished individuals. These individuals bring extensive knowledge of securities products, marketplace dynamics, econometrics, and securities legal and regulatory issues.

The members of this panel are:

Brandon Becker, Esq.
Partner
Wilmer, Cutler & Pickering

Matthew Gelber
Vice President of Order Flow Management and Trading Analytics
Fidelity Capital Markets

Kevin Murphy
Managing Director-Global Equity Derivatives
Salomon Smith Barney

Aulana L. Peters, Esq.
Advisory Partner
Gibson, Dunn & Crutcher

Roger Petrin
Managing Director
State Street Global Advisors

The Amex intends to submit to the SEC an accurate, insightful report on decimalization's effects on market quality and investors based on a meaningful amount of trading data

[2] At the end of the first quarter, 2001. Our main competitor's market share was approximately 35% for the same period.

across all three of the Amex product lines. Proposed rule changes or other market structure recommendations—which could be significant—will only be made after careful analysis by the Amex of this data, supported by the views and recommendations of a panel of experts. It is our aim to ensure that we, in a decimals environment, maintain an efficient, fair, and orderly marketplace that works to the best interests of investors and professional market participants alike.

Thank you for your time and attention to this letter and to an initiative that we believe may represent a sea change to the U.S. capital markets. If you have any questions on the Amex's decimalization efforts, please feel free to call me directly at (212) 306 1600, Cari Miller in the Amex Office of the Chairman at (212) 306 1213, or Marcia Asquith with our Government Relations Office at (202) 728 8831.

Very truly yours,

cc: Sen. Christopher J. Dodd, Ranking Member, Subcommittee on Securities and Investment
Marcia Asquith, Director, NASD Government Relations

PREPARED STATEMENT OF J. PATRICK CAMPBELL

PRESIDENT, NASDAQ U.S. MARKETS AND
CHIEF OPERATING OFFICER, THE NASDAQ STOCK MARKET

MAY 24, 2001

Introduction

Mr. Chairman and Members of the Subcommittee, I am Pat Campbell, President, Nasdaq U.S. Markets and Chief Operating Officer, The Nasdaq Stock Market. We welcome this opportunity to share with you our experience and insights into the recent conversion to decimal pricing on the Nasdaq Stock Market.

As the world largest stock market by every measure other than aggregate market capitalization (for example, in terms of the number of listings, dollar volume, transaction volume and liquidity), ensuring that decimalization of the market was not disruptive to investors and the U.S. capital markets was our primary concern. Crucial to our job as the world's largest provider of stock quote information is maintaining the availability, integrity, and accessibility of this data. The estimates of increased computer system demands made switching to decimals a challenging project. One study projected a three-fold increase in quotation traffic. Decimalization takes the market from 16 price points per dollar to 100 price points. Due to the hard work of our highly skilled employees, member firms and the Securities and Exchange Commission (SEC), I am glad to report that the decimalization was accomplished without incident.

We are proud of the often-cited characterization of Nasdaq as the Engine of the New Economy. However, we are much more than that. Across the board, we have been the home to more IPO's than any other U.S. market, providing crucial access to capital for new companies of all sizes and types to grow. These companies create jobs and add vibrancy to local economies. The impact of these benefits are felt in every State.

Nasdaq is dynamic and is adjusting to changing market realities in order to better serve our listed companies, member firms, and investors. As you may know, Nasdaq applied to the SEC to become a registered national securities exchange in November of last year. We expect the SEC to publish our application for public comment in the *Federal Register* in the immediate future, and we are hopeful for speedy approval of our application at the end of the comment period. This process will facilitate final separation of the Nasdaq from the NASD, lead to our ability to access the capital necessary for our Exchange to invest in new technology in order to remain a competitor in the world capital markets, and allow us to better serve our constituencies. In order to continue to be the preeminent global competitor, we have recently taken significant steps such as the March 27, 2001, acquisition of a majority interest in the pan-European Easdaq stock market, as well as the March 26, 2001, announcement of Nasdaq's partnership with the London International Financial Futures and Options Exchange to offer single stock futures in the United States. As you know, Nasdaq Japan, our undertaking with the Osaka Stock Exchange, is operational and is becoming an increasing presence in the Japanese equity market, particularly with respect to IPO's.

Early Analysis

I would caution that the initial trends are observed through a fast-track analysis intended to get information to the Subcommittee as quickly as possible. The data has not yet been verified by independent analysis, but is instructive as an important benchmark for short-term analysis. It is preliminary and will be continuously revisited as we gain more experience with the new environment. The three most important points I wish to share with you today are:

(1) Nasdaq's transition from fractions to decimals was smooth and seamless;
(2) Nasdaq's market has seen a dramatic decrease in spreads; and
(3) There is no evidence on our market, to date, that institutional investors are bearing the burden of any significant cost-shifting.

Nasdaq's Seamless Transition to Decimals

To achieve today's results in a very compressed time frame, virtually every computer system within Nasdaq was changed. This included an upgrade of the Enterprise Wide Network, a change to Nasdaq Workstations to allow for the display of decimal information, replacement of front-end processors with a higher-capacity computer architecture that allows for quoting and matching of decimals trades, and upgrades to back-office batch processing systems that calculate indices, dividends, etc. A similar effort took place among Nasdaq broker-dealers that required them to assess and redesign their systems and business models. This followed the first two pilots of decimalization for 212 Nasdaq stocks and 3 OTC Bulletin Board® (OTCBB) securities in March 2001. On April 9, 2001, all remaining Nasdaq-listed securities began being quoted in a decimal format with a $0.01 minimum price increment (for example "tick size"). Thus, Nasdaq has successfully completed the full conversion to decimal quoting and trading in approximately 1 month. Nasdaq has been carefully monitoring the impact of decimalization both through our on-line surveillance and market operations group and by gathering and analyzing data for the 2 week period prior to decimalization and comparing it to the 2 week period following decimalization (March 26, 2001–April 20, 2001). I would like to add that Nasdaq set a new share volume record only 7 days after full conversion to decimals—3.19 billion shares—and was able to handle that volume without incident.

Among the major concerns raised by conversion to decimals is the capacity impact on message traffic. There are two general classes of messages: quote updates disseminated by the various market centers and the Last Sale trade report disseminated by Nasdaq. We found that the number of quote updates for stocks increased by at least 12 percent after controlling for the day-to-day fluctuation in trading activity for the overall market. The Nasdaq systems have ample capacity to handle this increase.

As expected, decimals did not significantly increase the overall market trading activity. On average, stocks experienced only a 5 percent increase in trades and a less than 1 percent increase in volume.

Dramatic Decrease in Spreads

As expected, quoted bid-ask spreads declined substantially for most stocks. A quoted spread is an appropriate measure of costs for retail investors placing small market orders. All types of stocks saw dramatic decreases in quoted spreads; on average, the quoted spreads decreased by 51 percent. All else being equal, the decline was greater for more active and lower price securities—our most active stocks saw a 71 percent spread decline. Many of Nasdaq's most well known and widely held stocks, such as Cisco, Dell, Intel and Microsoft and others, now have quoted spreads of one cent. Similarly, effective spreads (spreads that take into account actual trade prices) declined for all stock groups by an average of 46 percent. This is in addition to the 30 percent decline seen following the order handling rules and move to sixteenths in 1997.

Many people expected the intra-day volatility to increase as a result of decimalization, the frequent change of the inside quotes. We use three measures of intraday volatility to analyze this issue:

- average magnitude of trade-to-trade price changes;
- average volatility of duration-weighted bid-ask-midpoint; and
- percentage differences of high and low prices of the day.

In all three measures, we did not detect any noticeable increase in volatility. In fact, the data indicates a decrease in volatility, consistent with what we found for the pilot issues. It should be noted that volatility, as measured during this time frame, could be influenced by a number of other market factors independent of decimalization.

Investor Costs

We also reviewed the extent to which penny increments have caused orders to be broken into smaller trades. We looked for trends in trade size by looking at the average number of shares per trade report. Contrary to what some academics had predicted, according to early indications the average trade size for the decimalized stocks decreased only by 4.6 percent. Obviously, this is a calculation that would be benefited by covering a longer time period.

The price dimension of quotes tells only part of the story. The quoted size is also significant. The Nasdaq quote montage is not a consolidated limit order book. Market makers frequently fill orders for far more size than indicated by their quotes, and they often fill orders at prices better than their own quotes. Nevertheless, analysis of the impact of decimals on displayed depth is of interest as it may be indicative of the total level of liquidity provided by the market. A more definitive analysis of liquidity postdecimals awaits future research.

Quoted depth at the inside quotes declined for the newly-decimalized stocks. Again, recall that decimalization moved from 16 price points per dollar to 100 price points. We looked at two measures of inside depth, the average aggregate quoted depth at the inside and the number of market makers and electronic communications networks (ECN's) displaying quotes.

This week, another effort was made by Nasdaq to analyze decimalization to understand its impact, if any, on institutional trading cost. While we believe this analysis is preliminary, we found good news for institutional trades on Nasdaq. It does not appear that decimalization on Nasdaq has caused higher institutional trading costs. A reasonable proxy to evaluate the cost of trades is to look at effective spreads. We know decimalization had a huge impact on retail trades, as effective spreads dropped by about 50 percent. We found that trading costs (effective spreads) fell for institutional trades as well. Effective spreads are based on actual trade prices, which are sometimes better and sometimes worse than the posted bid-ask quotes. The effective spread is defined as the twice the difference between the trade price and the average of the bid and ask (i.e, the quote midpoint).

We looked at large trades, and institutional trades specifically, to see if decimalization thinned-out the market and caused those effective spreads for large/ institutional trades to increase. We believe they did not. Our attempt to use our data showed "institutional" prints got better fills (lower effective spreads) after decimalization (although by insignificant amounts for 5,000-shareprints and higher) but the fills were slower. Again, this is based on the early days of decimal trading—as trading/sales practices adapt, this could change.

One issue that has caused significant controversy with the shift to decimals is "pennying" or trading in front of a standing order by a penny. On this issue it is useful to recognize the advantages allowed by the Nasdaq market model of an all electronic market with competing dealers and ECN's. Nasdaq's quotes may be electronically accessed with no participant being provided a second look, we have not heard significant institutional concerns expressed about "pennying" on Nasdaq. We believe competing market makers and ECN's provide a hybrid market environment that discourages such unfortunate behavior. In fact, it is important to note that Nasdaq has been trading in increments finer than pennies since before April 9, 2001. Decimalization for Nasdaq pertained to quotes. We do recognize, however, that some institutional investors retain significant concerns over the impact of decimalization on market liquidity and we will continue to aggressively monitor our market to identify any basis for such concerns.

Conclusion

Overall, the implementation of decimal trading for all Nasdaq stocks was carried out smoothly, as anticipated, with respect to capacity and market quality. Decimalization is a success story for Nasdaq, the industry and the American economy. We could not have accomplished it without the full cooperation of our member firms and their technology providers and the SEC.

Most of the results are consistent with what we had anticipated. Indeed, overall spreads declined by a larger-than-expected percentage. Investors are seemingly enjoying some improvement of prices because of the tightened spreads.

That said, we want to caution that decimal trading is still in a preliminary stage. As more time passes, we could see the results change over time. We plan to conduct our final detailed analysis for all three phases of decimalization for the SEC soon.

Thank you for the opportunity to share Nasdaq's experiences with decimalization. I would be happy to respond to your questions.

PREPARED STATEMENT OF CATHERINE R. KINNEY

GROUP EXECUTIVE VICE PRESIDENT, NEW YORK STOCK EXCHANGE

MAY 24, 2001

Chairman Enzi, Senator Dodd, and Members of the Subcommittee: My name is Catherine Kinney, and I am Group Executive Vice President of the New York Stock Exchange ("NYSE" or "Exchange"). I am pleased to be here today to relate some of the preliminary results of decimal trading.

Decimalization has been the most important occurrence in our capital markets in the last quarter-century. Congress and the SEC directed this initiative to accomplish significant policy goals. The NYSE is pleased to have facilitated the conversion process. The benefits of decimal trading have been realized, but the shift to a minimum price variation ("MPV") of 1 cent has created some difficulties. The NYSE is already taking steps to remedy some of these detrimental effects. In this regard, we urge that an MPV of no less than 1 cent be established by Congress or the SEC across all markets. Otherwise, the current difficulties will become worse, and the benefits of decimalization may be jeopardized.

Conversion to Decimals

The Exchange recognizes that conversion to decimals was a high priority for a number of Congressional leaders and for the Securities and Exchange Commission ("SEC" or "Commission"). The Exchange made a commitment to convert to decimals, and we are proud that our conversion was accomplished without systems or capacity problems. Most of our decimal conversion costs were incurred simultaneously with our Year 2000 system conversion. These simultaneous system upgrades cost approximately $30 million.

Decimal trading has increased the number of possible trading increments within a dollar from 16 to 100. This increased number of trading increments has required an increase in capacity for our trading systems. Since 1988, we have spent nearly $3 billion on technology to maximize capacity. We currently have the capacity to trade five times our average daily volume. Today, the NYSE has sufficient capacity to handle 2,000 messages, or orders, per second. Stated differently, capacity is 6 billion shares per day.

The Exchange launched decimal trading with a pilot project of seven stocks on August 28, 2000. Stocks in the pilot program were priced in dollars and cents instead of fractions, and the minimum pricing increment was one penny instead of 1⁄16 of a dollar. The pilot was extended to include 57 additional stocks on September 25, and 94 stocks were added on December 4. The Exchange completed the conversion by trading all 3,525 listed issues in decimals on January 29, 2001, more than 2 months ahead of the SEC's deadline of April 9. Throughout the conversion process, all Exchange systems performed efficiently and without problems.

Trading in a Decimal Environment: The Early Results

We are confident that the conversion to decimal pricing has accomplished important public policy goals: It has brought U.S. markets into conformity with quoting and trading systems used around the world. This will help U.S. equity markets to expand their foreign listings, and will facilitate globalization of equity markets.

Our preliminary analysis of conversion to decimal pricing indicates that, on balance, the penny increment has been good for some retail investors. Stock prices in decimals are certainly more understandable. Over the last decade, direct share ownership by individual investors has increased, and decimal prices will encourage this trend by breaking down a barrier to understanding the market. Spreads have been reduced, and price improvement on the NYSE has increased.

The smaller price variation (a penny) encourages price competition. Results to date indicate a tightening of the bid-ask spread—the differential between the highest quote to buy (the "bid") and the lowest seller's asking price (the "ask")—by approximately 37 percent. This is particularly beneficial to small investors, especially those trading in the most active stocks.

We have also seen an increase in price improvement, particularly for smaller orders. In orders that do not exceed the quoted size of the best bid or offer, the price improvement rate on the NYSE has increased from 35.2 percent to 50.7 percent.

On the other hand, the one-cent MPV has significantly impacted institutional investors. The Exchange has monitored, and continues to monitor, the effect of this change on investors and on the operation of the market. The market is continuing to acclimate to this new environment, and it is premature to draw any sweeping conclusions. But, we have observed some trends that I will summarize.

Decimal trading has had a number of detrimental impacts on mutual funds, pension funds and other institutional investors, who act on behalf of individual investors. These investors, who tend to trade in large blocks, have experienced a lack of transparency and reduced depth at the published NYSE quote (best bid and offer), and an increase in number of execution reports (for example, the number of transactions necessary to fill an order). These market participants are an important source of liquidity.

We conducted a one-week analysis of a random sample of 150 stocks to assess the degree to which trades occurred at a minimum variation before and after decimalization when the bid or offer equaled or exceeded 10,000 shares. We found a significant decrease in occurrence in a one-cent variable compared to a 1⁄16 variable. We also found that a majority of these occurrences were initiated by a floor broker or an order received through the Super Dot system, rather than by a specialist.

The impact on the institutional investor is an inevitable outgrowth of the decrease in the minimum price variation from 6.25 cents to one cent. This decrease in the MPV has lowered the transparency of the market and thus made it harder for institutional investors to find the right price for the liquidity they require.

Our research to date shows a significant 67 percent decrease in the number of shares available at the published NYSE quote. While true liquidity (for example, actual interest from all sources) available may not have been significantly impaired, there has been a significant impairment of transparency.

Nevertheless, because liquidity is spread-out over a number of price points, institutions have found that it takes significantly more trades in a decimal environment to execute a large order compared to trading in sixteenths. We have canvassed institutional investors serving on our Institutional Traders Advisory Committee, Pension Managers Advisory Committee and Advisory Committee on Decimalization, and this has been a leading complaint.

We have acted to address the transparency concerns of the institutional investor. The Exchange has initiated two changes to pemit dissemination of "depth indications" and "depth conditions" in our listed securities. These initiatives are the first in a series of actions the Exchange will implement to improve transparency and communication of market depth in a decimal trading environment.

In March, the Exchange began to disseminate an "indicator" of additional market depth. The range is currently defined as 20,000 shares within 15 cents of the bid, offer, or both. Part two of this effort began this week, with the ability to disseminate "depth conditions." The "depth condition" shows liquidity beyond the best bid or offer without the predefined, limited parameters of the "depth indicator".

In addition, next month, we intend to introduce Open Book, which will provide data in orders residing at each price point in specialists' display books. We also are proliferating hand-held technology called E-Broker, which allows floor brokers to electronically communicate "market looks" at the market depth to customers from the point of sale.

In addition, we have formed an Advisory Committee on Decimalization to review decimal trading at the Exchange and to make recommendations based on that assessment. The Committee is comprised of representatives from various Exchange constituencies, including representatives of our Pension Managers Advisory Committee, Institutional Traders Advisory Committee, the NYSE Board of Directors, and specialists and floor brokers. As more definitive information becomes available from our review of the effects of decimal pricing, we will share it with the SEC.

The Future

The work of the Advisory Committee on Decimalization is ongoing, and it will continue meeting to consider initiatives to facilitate price discovery in a decimal environment. We are reviewing Exchange trading rules to ensure that they are appropriate for the changes that are occurring. We will also be working with academics to study these issues.

The SEC has requested that we provide a preliminary report by September 10 on the impact of decimal pricing on systems capacity, liquidity, and trading behavior, including an analysis of whether there should be a uniform minimum increment. The SEC has further requested all markets to submit by November 4 proposed rule changes establishing their individual choice of minimum pricing increments.

We believe an MPV of less than a penny would undermine the benefits that decimal pricing has brought to the markets, while at the same time exacerbating the problems that decimal pricing has caused for institutional investors. An MPV of less than a penny would provide no real benefit for individual investors. It would reverse the harmonization of U.S. pricing with that of overseas markets. And it would be a step backward in improving clarity of stock prices for individual investors.

In addition, the problems that institutional investors have faced in trading at an MPV of one cent would increase exponentially if markets were permitted to quote and trade in increments of less than one cent.

If the SEC decides to establish an MPV greater than a penny, we believe that the variation should apply to trades and quotes; to trade at a variation lower than the quote minimum would give dealers an unfair advantage.

The NYSE intends to be competitive in the marketplace under all circumstances as it relates to the issue of the MPV, and will continue to assess the best means of addressing the transparency problem resulting from liquidity dispersed over more price points.

I appreciate the opportunity to testify today, and I would be pleased to answer any questions.

PREPARED STATEMENT OF KENNETH D. PASTERNAK

CHAIRMAN AND CHIEF EXECUTIVE OFFICER, KNIGHT TRADING GROUP, INC.

MAY 24, 2001

Chairman Enzi, Senator Dodd and Members of the Senate Banking Securities and Investment Subcommittee, thank you for this opportunity to testify today about the impact of trading in decimals. My name is Kenny Pasternak. I am Chairman, Chief Executive Officer, President, and Co-Founder of Knight Trading Group, the world's largest wholesale market maker for shares of both Nasdaq and non-Nasdaq equities. We are also a growing options market maker and an asset manager.

At Knight, we like to think of ourselves as providing the processing power behind the explosive growth in securities trading via the Internet. We founded Knight with the purpose of empowering self-directed individual investors—to give them the same speed, low cost and dependability in their securities transactions long enjoyed by large institutional investors. We are committed to offering the same efficient, dependable service, whether people wish to trade a single share of stock or a thousand shares—so our interest in the issues under discussion here today is acute.

The Subcommittee has asked me to assess how decimal pricing is affecting the trading environment; whether the anticipated benefits of decimalization are being realized; and whether the transition to decimalized trading has brought about a need for change in securities regulations.

Decimal Pricing Has Led To Reduced Spreads But Not Always Lower Trading Costs

To answer the first of these questions, U.S. stock markets recently adopted decimalized trading in the belief that it would narrow spreads and lead to less costly order execution.

There is no doubt that spreads have fallen. According to preliminary data, quoted spreads for Nasdaq stocks have fallen by an average 51 percent since the advent of decimalized trading. The decline has been greatest for the most active, lower-priced securities, which saw a 71 percent decline in quoted spread. Effective spreads [1]—a better measure of investor cost—fell by an average of 46 percent.

It is important to note that the introduction of decimalized pricing is not in itself responsible for the narrowing of spreads. Rather, spreads have narrowed as a result of the decision by major market centers to reduce their Minimum Price Variation, or MPV. In 1997, when the major market centers dropped the MPV from one-eighth of a dollar (12.5 cents) to one-sixteenth of a dollar (6.25 cents), the narrowing of spreads reduced trading costs for many investors, but increased costs for others. With the MPV now at a penny, the number of investors for whom costs have increased has been magnified. In other words, a higher percentage of orders are being processed less efficiently.

Today's one-penny MPV has reduced price discovery, diminished liquidity and increased the level of trading activity required to execute an entire order. No market participant has an incentive to quote in size, as others can easily coopt that information and trade ahead by as little as one penny. While such problems were once experienced only by institutional investors, they now affect increasing numbers of individual investors as well.

Knight Trading Group supports decimalization. We believe that by making stock prices easier to understand, decimalization encourages market participation and, therefore, benefits everyone. My purpose today is to focus this Subcommittee's attention on the adverse effects of the dramatic reduction in MPV adopted by the major market centers at the time when they implemented decimal pricing.

The one-penny MPV is, in many circumstances, too small. In my view, the most important issue for this Subcommittee's consideration is how to encourage the markets to arrive at the correct MPV for a given set of circumstances. The thrust of my testimony today will be to explain why this issue is vital to the depth, liquidity and overall strength of our markets.

How the One-Penny MPV Hurts Investors

The major market centers' recent adoption of the one-penny MPV has had enormous unintended consequences. Preliminary data suggests that, even for retail-sized orders, trading outside the spread has increased dramatically. The price discovery process has been impeded because displayed depth on Nasdaq has also declined—to approximately one-third of what it was before the transition to trading in decimals. Meanwhile, we see that more and more investors feel compelled to break down their buy and sell orders into smaller lots in order to achieve more control over their executions. Trades generally have increased in number but declined substantially in size.

In addition, the one-penny MPV has occasioned a significant decline in the average number of market participants at the inside quote. In other words, those who provide enhanced liquidity to the markets are now committing less capital for the execution of individual investor trades than they did before the one-penny MPV.

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[1] Nasdaq Economic Research defines the effective spread as twice the absolute difference between the actual trade price and the prevailing bid-asked mid-point.

Those who proactively provide enhanced liquidity constitute a large and highly competitive industry that is absolutely essential to the efficient operation of the markets. They often provide liquidity automatically in amounts larger than the National Best Bid and Offer (NBBO). This automatic execution feature expands as the MPV increases and shrinks as the MPV decreases.

At present, because of the one-penny MPV, many retail investors are paying more as the nature of executions changes from fast and complete to slow and fragmented. For example, during the month of January, Knight Securities alone provided liquidity above the NBBO size level in excess of 179 million shares. Without our enhanced liquidity, we estimate conservatively that investors would have paid nearly $4 million more in execution costs.

With the advent of the one-penny MPV, however, we and our competitors are providing enhanced liquidity in many fewer instances. Whereas, we previously provided instantaneous automatic execution at the NBBO price for any order of up to 2,000 shares, we now reserve automatic execution for much smaller orders. And in many instances, we do not offer automatic execution no matter how small the order.

This decline in the availability of enhanced liquidity for Nasdaq stocks, coupled with the lower average quoted size, translates into slower and more fragmented executions—and ultimately higher costs for investors.

In the listed markets, what we are seeing is a pronounced increase in the number of ITS "trade-throughs." As you know, ITS—the Intermarket Trading System—is the linkage between the major exchanges and other trading centers. When an ITS participant like a New York Stock Exchange specialist sees another trading center offering a better price for more than a hundred shares, the specialist is obliged to either match that price or else forward the order on the investor's behalf. When the specialist fails to make good on that obligation, the omission is known as a "trade-through." It means that the investor may actually receive a price dis-improvement.

Our subsidiary, Knight Capital Markets (or KCM), which trades New York and American Stock Exchange listed equities on the Nasdaq InterMarket™, has seen a marked increase in the number and frequency of Exchange member trade-throughs. During the first six trading days in February 2001, when decimal trading was introduced in all listed stocks, KCM experienced an average of more than 2,500 trade-throughs per day by NYSE members—a more than four-fold increase over the predecimalized period.

Anachronistic Rules and Regulations Need To Be Reviewed

Before investors can realize the full benefits of decimalization, including cheaper order execution, Congress, the SEC and the major market centers must address the negative consequences of narrowing spreads. Some of the blame can be traced to outdated rules and regulations that were written for an era of fractional pricing and substantially larger MPV's.

One area that needs review is the long-held notion that our NBBO's standard provides the most accurate barometer as to whether an investor has received best execution. The concept of best execution remains a cornerstone of our markets, implying that broker-dealers have a duty to seek the most advantageous terms for their customers' transactions.

For many years, the NBBO has been regarded as the ultimate measure of best execution. The NBBO, the consolidated stream of transaction reports and quotations mandated by Congress in 1975, has been available to the public on a real-time basis. Retail investors have come to expect automatic execution for orders up to a thousand shares at the NBBO's price or better.

Automatic executions and guaranteed liquidity are decreasing as liquidity providers become less proactive. It is time to acknowledge that the NBBO has become less indicative of market liquidity. With the advent of the one-penny MPV, the NBBO has lost its value for all but the smallest orders. It gives no indication as to the price at which many orders can be executed in their entirety and at what speed.

Indeed, the NBBO's prices can actually mislead the public with respect to the quality of order executions available among various market centers trading the same issues. The quality of executions afforded investor market orders by various market centers can vary widely in relation to the consolidated NBBO at the time of order receipt. The price at which an order was executed may not reflect the greater liquidity that might have been available at a competing market center. In short, the NBBO should no longer be regarded as sacrosanct.

Best Execution Entails More Than Getting the Best Price

In many instances, price should not be the primary consideration in determining best execution. In the past, a broker-dealer could argue persuasively that it had discharged its best execution obligation merely by providing price improvement. Today, however, in an environment of narrowed spreads and diminished liquidity, providing price improvement may be less important than executing an order promptly and in its entirety. Broker-dealers should be obligated to consider such criteria as order size in seeking the destination that will provide the best execution.

Other Impediments to Fairer, More Efficient Markets

While the Subcommittee and the SEC are reviewing the rules governing the National Market System, we would encourage them to consider a number of other impediments to fairer, more efficient markets. These include:

- The issue of connectivity, as manifested through market-center linkages.
- The proper means of encouraging market participants to quote and perform price discovery in larger sizes.
- The Short Sale Rule and other outmoded regulations that actually impede the efficient handling of orders. Short-selling by market professionals increases market liquidity, helping to offset temporary imbalances in supply and demand. It also reduces the risk that the price paid by investors will be inflated by temporary supply impediments.
- And finally, the need for a new Trade-Through Disclosure Rule for equities, similar to the rule recently adopted by the SEC for options trading. Such a rule would require broker-dealer disclosure whenever a customer's order is executed at a price that is inferior to a published quote on another exchange. The rule would not supplant the broker-dealer's duty to provide best execution, but it would provide investors with the means to monitor broker-dealer performance, while encouraging broker-dealers to develop effective means of accessing better quotes published by other markets.

Conclusion

Let me conclude by citing the words of recently retired SEC Chairman Levitt:

> It is not the pace of technology or the brilliance of innovation . . . that guarantees the success of our markets, but rather an unyielding commitment to quality. Quality in the marketplace is faster, cheaper execution of transactions . . . [and] efficient price discovery. Quality is the best execution of customer orders. Quality . . . is the protection of the investor interest. This last principal . . . reaffirms a simple and salient truth—markets exist by the grace of investors.[2]

That same "simple and salient truth" is at the heart of the issues we are discussing today: Whether our domain is Wall Street or Main Street, we are obliged to do what best serves the interests of all investors—large and small.

The implementation of trading in decimals has made the markets more accessible to investors, but it has also led to a number of profound changes that diminish market liquidity, as well as the speed and efficiency with which investor orders are being executed.

Only by recognizing and adapting to the changes occurring in the U.S. markets can we continue to protect the investor, strengthen market integrity, and maintain the position of leadership that our markets enjoy globally. Therefore, we hope that Congress and the Commission will review the Securities Exchange Act of 1934—especially its rules regarding the National Market System—then take the necessary steps to create markets that are fairer and more efficient for the largest possible number of trading participants.

As this Subcommittee ponders the significant public-policy issues surrounding decimal pricing, my colleagues and I at Knight would welcome any opportunity to contribute further to the discussion.

Thank you.

[2] Arthur Levitt, Dynamic Markets, Timeless Principles, Remarks at Columbia Law School, New York, NY (September 23, 1999) (transcript available at http://www.sec.gov/news/speeches/spch295.htm) (emphasis added).

PREPARED STATEMENT OF DONALD D. KITTELL

EXECUTIVE VICE PRESIDENT, SECURITIES INDUSTRY ASSOCIATION

MAY 24, 2001

I am Donald D. Kittell, Executive Vice President of the Securities Industry Association.[1] SIA worked with its member firms, the U.S. equities and options exchanges and Nasdaq, clearance and settlement organizations, service bureaus, market data vendors and the Securities and Exchange Commission to successfully convert the U.S. equities and options markets from fraction-formatted trading to decimal-formatted trading earlier this year. The conversion took 3 years to accomplish and cost in excess of $1 billion, according to estimates developed by the Tower Group on behalf of SIA. The conversion itself was accomplished smoothly, to the credit of all participants involved.

I have organized my comments on the impact of decimalization into four subjects:

I. Systems and Operations
II. Trading Rules and Regulations
III. Market Making
IV. Investor Benefits

I would summarize SIA's conclusions on the impact of decimalization as follows:

(1) The systems and operational aspects of the conversion went extremely well, primarily as a result of a carefully constructed phase-in process of pilot trading, testing and evaluation by each market participant. Industry participants worked well together to accomplish the conversion—literally without incident. Thus far, actual message traffic has not reached the levels that early studies anticipated; however, it is still early to conclude that message traffic projections were overstated.

(2) Trading rules and regulations are currently under study by market participants, self-regulatory organizations and the SEC. These rules address minimum price variation, short sales, limit order disclosure and protection, trade throughs, best execution, locked and crossed markets and block trading. It seems clear that timely adjustments to some of these rules are required.

(3) The economics of trading and market making are under intense review by market participants and may be expected to result in changes in strategies and practices by securities firms and institutional trading desks. We expect this process to evolve over many months.

(4) It is clear that the benefit of decimalization to investors is a complex subject which will be debated for some time. It is clear that the simpler "language" of decimals is a benefit. It is also clear that the harmonization of decimals across products and across international markets is a benefit. SIA believes that removal of the cloud of suspicion surrounding fractions was a constructive step. Conclusions about market liquidity, trading volume, volatility transaction costs, global competitiveness and the relative economic impacts upon market participants would, in our judgment, be premature.

Each market center is required by the SEC to submit a study to the Commission regarding the impact of decimal pricing on systems capacity, liquidity, and trading behavior, including an analysis of whether there should be a uniform minimum increment for a security. These studies are due June 9, 2001. In the interim, Nasdaq has released three decimal impact studies which area very useful. SIA has not seen impact studies from the other exchanges.

I. Impact of Decimalization on Industry Systems and Operations

(1) The securities industry's conversion of the equity and options markets to decimals took place, for listed securities, on January 29, 2001 and for Nasdaq securities on April 9, 2001. The conversion proceeded smoothly and essentially without incident. All industry participants—exchanges, Nasdaq, specialists, market makers, data vendors, service bureaus, clearance and settlement organizations and securities firms reported a seamless transition.

(2) The conversion to decimals followed 34 months of planning, coordination and testing. The cost of the conversion is estimated at in excess of $1 billion, by the

[1] The Securities Industry Association brings together the shared interests of nearly 700 securities firms to accomplish common goals. SIA member-firms (including investment banks, broker-dealers, and mutual fund companies) are active in all U.S. and foreign markets and in all phases of corporate and public finance. The U.S. securities industry manages the accounts of approximately 50 million investors directly and tens of millions of investors indirectly through corporate, thrift, and pension plans. In the year 2000, the industry generated $314 billion of revenue directly in the U.S. economy and an additional $110 billion overseas. Securities firms employ approximately 770,000 individuals in the U.S. (More information about SIA is available on its home page: *http://www.sia.com*.)

Tower Group on behalf of SIA. These costs include programming changes, capacity increases and internal, as well as industry testing.

(3) Message traffic (quotes, trades and administrative messages) has not risen to the levels projected by SRI Consulting in April 1999; however, it should be noted that SRI's projections were made during a period of very high market activity and were "as of" December 31, 2001. We do not yet have experience in a market environment comparable to early 1999.

(4) The SRI message traffic projections for options trading presented the most serious challenge to capacity. The options markets have introduced multiple listing, the quoting of size and the launching of a new Exchange at the same time as the conversion to decimals. As a result, the options exchanges have decided to trade in minimum price variations of 5 cents and 10 cents, instead of in pennies.

(5) Market makers, specialists and trading desks report an increase in administrative workload as a result of the increase in trading increments. This workload deals with increases in cancels, cancel-and-replaces, rejects and breaks, as well as the increased number of partial executions and executions per order. SIA has not attempted to quantify the increase in workload. It would be reasonable to assume that as market participants adapt to the decimal environment, productivity should improve.

(6) Some SIA firms have raised concerns about the lack of a standardized decimal format in the Nasdaq market. The NYSE listed market provides that quotes and trades take place in pennies, with average prices of block trades carried out to four decimal places. The Nasdaq market provides that quotes be in pennies, but has no similar standard for trades. As a result, some Nasdaq market makers and ECN's execute trades carried out to mills, with the number of decimal places to the right of the decimal varying by participant. This lack of standardization is confusing and may result in operational inefficiency.

II. Impact of Decimalization on Trading Rules and Regulations

The conversion to decimals impacts at least four sets of trading rules and regulations. The exchanges, Nasdaq, self-regulatory organizations and SIA's regulatory and trading committees are currently reviewing these rules and regulations as the industry gains experience in decimal trading.

(1) Minimum Price Variation: The NYSE currently quotes and trades in penny increments. Nasdaq quotes in pennies but allows trading in mills. The options exchanges currently quote and trade in increments of 5 cents for options priced under $3 and of 10 cents for options priced over $3.

Each Exchange is anticipated to make recommendations as to minimum price variations in its June study.

(2) Rules that are "triggered" by price ticks: A number of SEC and SRO rules are "triggered" by price ticks. Examples include the short sale rules, limit order disclosure and protection rules, and the intermarket trading system trade-through rule. Decimalization has resulted in industry participants questioning whether these rules can be effectively managed in a fast moving environment of fluctuating penny (or mill) ticks. Participants also question whether such ticks are economically significant. It may be that some of these rules should be triggered by large tick sizes.

(3) Best Execution Rules: The concept of "best execution" has been debated in the industry for many years, but the smaller pricing increments of decimals complicate the debate. It has long been recognized that the characteristics, which define "best execution," include factors other than pure price, such as speed of execution and size of trade. Decimalization has resulted in finer pricing increments, and at least in the case of Nasdaq, a greater number of trades outside of the best bid and offer.

The SEC has recently adopted two new rules governing the Disclosure of Order Execution and Routing Practices (Rule 11 Ac 1–5 for market centers and Rule 11 Ac 1–6 for broker-dealers).

Some SIA firms are concerned about the accuracy of the data that they will be reporting and the conclusions that may be drawn from this data particularly about trades executed outside of the best bid and offer for legitimate business reasons.

Reporting under the SEC's new disclosure rules will begin in June and be phased in between June and October 2001. SIA anticipates a great deal of discussion among industry participants, regulators and third-party observers as to the accuracy and meaning of the newly reported data in a decimal environment.

(4) Block Trading Rules: Institutional trading desks have voiced concerns about the reduction in displayed depth as a result of decimalization, as well as problems with entering limit orders and the breaking up of large orders as they interact with the NYSE auction.

SIA understands that a committee formed by the NYSE is addressing these and related issues. We look forward to the recommendations of this committee, as well as to the introduction by the NYSE of new functionality to provide greater information about market depth. We understand that Nasdaq is also addressing the issue of greater displayed depth.

The ways in which market centers deal with integrating the institutional and retail markets to insure fairness to all market participants is a critical issue, made more complex by the conversion to decimal trading.

III. Impact of Decimalization on Market Making

Decimalization has resulted in significant reductions in the quoted spreads (and "effective spreads") reported by market centers. The reduced spreads have given rise to conjecture as to the impact of decimalization on specialist and market maker profitability, the future viability of payment for order flow, the prospect of Nasdaq market makers introducing commissions on top of "net trades," a possible increase in proprietary trading by market makers, the potential for capital being withdrawn from unprofitable market making activities and other issues of concern to market makers. SIA firms are addressing these issues individually, and when appropriate, in trading and regulatory committees.

SIA's conclusion at this stage of decimal trading, is that it is too early to tell how these issues will resolve themselves. The conversion from one-eighth trading to one-sixteenth trading took a number of months to settle down and the introduction of the new order-handling rules continues to evolve. It may be many months before we see a clear picture of the impact of decimalization on market making activities.

IV. Impact of Decimalization on Investors

It is clear that the benefits of Decimalization to investors is a complex subject which will be debated for some time. It is clear that the simpler "language" of decimals is a benefit. It is clear that the harmonization of decimals across financial products and across international markets is a benefit. SIA believes that removal of the cloud of suspicion surrounding fractions was a constructive step.

SIA has always been skeptical about the assertion that Decimalization would produce huge savings for investors as a result of reduced spreads. The arithmetic supporting this assertion is too simplistic to consider the effects of price movement, trade size, liquidity, transaction costs and other factors that govern the economics of trading.

SIA has also been skeptical about the issue of global competitiveness. A study conducted by SRI on behalf of SIA indicates that the U.S. equity markets are more than competitive with international equity markets in spite of the use of fractions.

SIA firms report complaints from both institutional and retail customers relative to the number of trades and the time required filling an order. Institutional firms report complaints about their inability to see displayed depth and to find liquidity.

Conclusions about market liquidity, trading volume, volatility, transaction costs, and the relative economic impacts upon market participants—institutional and retail customers, as well as market markers and specialists—would, in our judgment, be premature until trading behavior settles down over the course of many months. We also suspect that it will be difficult to generalize these conclusions because experience will vary by type of security, type of market center, and type of customer. Further, the experiences of each of these groups will vary as market activity changes over time.

Securities Industry Association
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July 13, 2001

The Honorable Michael B. Enzi
Ranking Member
Subcommittee on Securities and Investment
U.S. Senate Committee on Banking, Housing, and Urban Affairs
SR-290 Russell Senate Office Building
Washington, D.C. 20510-5004

Dear Senator Enzi:

The Securities Industry Association ("SIA")[1] appreciated the opportunity to testify on behalf of its member firms before your Subcommittee on May 24, 2001 on the impact of decimalization in the United States securities markets. As you are aware, the U.S. Securities and Exchange Commission ("SEC") testified at the same hearings, and indicated at that time that it will revise or repeal Rule 10a-1 under the Securities Exchange Act of 1934, commonly known as the "short sale rule." On June 15, 2001, you requested via facsimile the views of SIA member firms on the SEC's intentions to revise or repeal this rule. Specifically, you questioned whether SIA member firms believe the short sale rule has any continued economic or policy justifications and, if so, what market capitalization and trading volume thresholds, as well as other criteria, are appropriate.

Pursuant to your request, we discussed this rule with our member firms, several of which acknowledged that there are various problems with applying the short sale rule today, particularly in this era of penny increment trading and sophisticated trading strategies. The initial view of some SIA member firms was that the rule may still serve a useful purpose, but perhaps could be revised to take into account recent market events and trading strategies. Other firms, however, questioned whether the short sale rule is still necessary, and suggested that the rule's original regulatory and market surveillance objectives may be met either through existing SEC anti-fraud and anti-manipulation rules or through the vast array of sophisticated regulatory and market surveillance mechanisms

[1] The Securities Industry Association brings together the shared interests of nearly 700 securities firms to accomplish common goals. SIA member firms (including investment banks, broker-dealers, and mutual fund companies) are active in all U.S. and foreign markets and in all phases of corporate and public finance. The U.S. securities industry manages the accounts of nearly 80-million investors directly and indirectly through corporate, thrift, and pension plans. In the year 2000, the industry generated $314 billion of revenue directly in the U.S. economy and an additional $110 billion overseas. Securities firms employ approximately 770,000 individuals in the U.S. (More information about SIA is available on its home page: http://www.sia.com.)

prevalent in today's markets. Finally, some firms advocated that any revised rule not further complicate a firm's ability to comply and that it apply uniformly to all market participants and to all securities (including single stock futures and listed options).

Most SIA member firms that we contacted, however, would prefer to more fully respond to your questions after they have had an opportunity to review the SEC's rulemaking proposal on the short sale rule and the decimalization impact studies that are expected from the SEC and certain self-regulatory organizations over the next several months. SIA member firms believe that consideration of these documents is important to formulating their views on the short sale rule. As a result, the SIA cannot provide you at this time with complete responses to your questions; however, you may be assured that we will continue to discuss this important topic with our member firms.

Thank you for this opportunity to continue discussing the impact of decimalization in our securities markets and, in particular, the SEC's intentions regarding the short sale rule.

Sincerely,

Donald D. Kittell
Executive Vice President

PREPARED STATEMENT OF PETER JENKINS

MANAGING DIRECTOR AND HEAD OF GLOBAL EQUITY TRADING
ZURICH SCUDDER INVESTMENTS

MAY 24, 2001

Good morning, Chairman Enzi, Senator Dodd and Members of the Subcommittee on Securities and Investment, I thank you for the opportunity to comment on the implementation and future of the decimalized market. My name is Peter Jenkins and I serve as Managing Director and Head of Global Equity Trading at Zurich Scudder Investments.[1] Zurich Scudder Investments manages nearly $400 billion in individual accounts, institutional portfolios and mutual funds, as well as private equity, private debt and hedge fund assets. Our clients include individuals, institutions, corporations, retirement funds, pension plans and insurance companies. It is important to note that while Zurich Scudder Investments, as well as other mutual funds, are correctly viewed as institutional investors because we frequently execute large sized-orders, we are acting on behalf of the millions of individual investors who put their trust in us to invest their money.

As a trader for the last 21 years, I speak today on behalf of Zurich Scudder Investments, though the views that I express are shared by the Investment Company Institute, as well as many of my colleagues on the buyside. My comments today will illustrate some of the practical frustrations we as institutional traders face daily. I submit that the suggestions I offer will enhance overall market efficiency, which, in turn, will benefits all market participants and U.S. consumers.

As a preliminary comment, I would like to point out that I strongly support the move to decimal pricing in the U.S. securities markets and the trading of securities in minimum increments of one penny. The move to smaller trading increments reduces the spread in securities, which in turn will result in benefits to our shareholders. In addition, the implementation of decimalization has enabled the pricing of securities in the United States to conform with securities markets around the world. Most institutional traders, such as myself, are continually adjusting to the new trading environment and we are already seeing the development of competitive products to help us cope with the change.

Critics have contended that the problems that market participants are facing since the move to decimalization have arisen solely as a result of that move. I do not believe this to be the case. Instead, I would suggest that many of those problems are the result of the underlying structure of the securities markets on which we trade. Decimalization has simply brought these long-standing issues to the forefront, thereby highlighting the urgency of addressing several unresolved market structure issues. These include the need for the display of a meaningful depth of limit orders by both specialists and market makers; the need for priority rules for orders entered into the securities markets; and the need to address problems arising from the internalization of orders. I have long advocated that with the move to decimals, we need greater transparency and increased electronic access to the floor. Since decimalization, there are many more transactions, yet overall trading volume has not been affected. Furthermore, the depth or amount of shares on the inside market has been reduced.

I should note that most of the difficulties that I have faced since decimalization have occurred while trading on the New York Stock Exchange (NYSE). In contrast, we have had few such problems when trading securities on the Nasdaq Stock Market, due largely to the fact that electronic communications networks (ECN's) have offered efficient access and have allowed traders to deal in smaller increments while at the same time retain control over order flow. The NYSE has taken some bold steps to address these emerging market issues, including the implementation of the "Network NYSE," a program that offers a limited degree of transparency and connectivity for both institutional and retail customers. Furthermore, I commend the Exchange for attempting to address some of the unintended consequences of

[1] Zurich Scudder Investments is the global investment management business of Zurich Financial Services Group (ZFSG). ZFSG is a global leader in the financial services industry, providing its customers with solutions in the area of financial protection and asset accumulation. The Group concentrates its activities in five business segments: nonlife and life insurance, reinsurance, Farmers Management Services and asset management. Headquartered in Zurich, Switzerland, the Group's worldwide presence builds on strong positions in its three key markets: the United States, the United Kingdom and Switzerland. It has offices in more than 60 countries reaching 35 million customers and employing 73,000 people (30,000 of which are in the United States). Based on consolidated figures for 2000, the Group achieved gross premiums of USD 50 billion. This amount includes insurance deposits, as well as premiums from the Farmers P&C Group. The net income amounted to USD $2.33 billion.

decimalization by introducing two initiatives—Depth Condition and Depth Indicator—to increase transparency and improve the communication of market depth in a decimal trading environment, and by allowing users to view the entire NYSE electronic limit order book.

Since the implementation of decimalization on the NYSE, the execution of large orders has actually been hampered by the reduced transparency of orders on the Exchange's limit order book and by increased instances of market participants stepping ahead of orders by increments of as little as one penny. The net effect has been for the institutional trader to lose control of his/her order flow, since no effective tools exist in the NYSE listed market to reach the market efficiently. The "upstairs" trader does not have the time to negotiate trades as quotes change rapidly. This lack of control has led the "upstairs" trader to expose less to the Market for fear of being "front run" for a penny (See Attachment A). Examples such as this have created a disincentive for market participants to enter orders of any significant size into the Exchange. As a result, an increasing amount of order flow has left the Exchange and been directed to alternative markets where institutions face less of a risk of having their orders stepped ahead, further fragmenting the listed market.

These problems are not due to decimalization. They result from the fact that the NYSE does not provide sufficient protection to the orders that I—and other institutional traders—utilize in trading large amounts of stock. Today, when an electronic order is sent to the exchange via Super Dot (an electronic order routing system that links member firms to specialists' posts on the trading floor,) the order is first exposed to the brokers on the floor who surround the specialists post prior to actually interacting with the Limit Order book. This technique is called "an attempt at price improvement." If an electronic order is small, it may in fact receive price improvement. If, on the other hand, the electronic order is large, the specialist may first allow the crowd to interact with the limit order prior to execution of the trade.

These hidden orders in the "pockets" of the floor brokers gain standing. When an institution attempts to interact with limit orders on the book, most institutional traders feel this exposure to the crowd is unnecessary. If the "upstairs" trader were able to interact with the limit order book without delay, floor brokers might be compelled to make instantaneous decisions and not use limit orders as options. In order to resolve these problems, institutions must have facilities for the automatic execution of large orders on the Exchange and the ability to trade large orders without subjecting those orders to the price improvement mechanisms.

These remedies to the problems that institutions are facing were recently included in a letter from the Investment Company Institute (ICI) to the NYSE, which I have attached as part of my official statement (See Attachment B). In this letter, the ICI recommends changes to the NYSE's new system to facilitate the ability of institutional investors to trade large orders on the Exchange ("Institutional Xpress"). Specifically, the ICI recommends that large orders eligible for execution in that system should not be permitted to be represented by specialists to the crowd on the floor of the Exchange. In addition, the orders do not become expressible until it is on the best bid or offer for a time period of 30 seconds. This should be changed, to enhance efficiency, there should be no time limit. Institutional Xpress also requires that an order be at least 25,000 shares in size—this number is too high. Furthermore, Institutional Xpress should be able to reach through the offer to get to the available liquidity pool. These are all significant concerns that must be addressed.

While the NYSE and the specialists will tell you that they are benefiting investors by providing price improvement, I, along with my colleagues on the buyside (would gladly forego this price improvement, which can be as little as a penny in a decimal environment, to receive protection for our displayed orders. By making this change to the Institutional Xpress system, the NYSE has the opportunity to promote the placement of limit orders on the book by providing protection for, and rewarding the placement of, those orders and attracting order flow. These improvements that I suggest will serve to increase the depth and liquidity of the market. The changes I suggest—both a stronger limit order book and greater transparency—will result in enhanced liquidity for all users of the NYSE. Greater liquidity enables more cost-effective execution. It follows that the more transparent the market is, the more informed decisions an investor can make whether he/she is an institutional trader or a retail customer.

In closing, I have directly worked with the NYSE and other exchanges for years to voice my opinions—as well as competitors'—on how best to provide institutions the liquidity to perform effectively on behalf of our clients' portfolios. These changes pose no threat to the NYSE, rather, these enhancements offer the ability for institutions and retail participants to transact efficiently and at the best price.

I thank you again for this opportunity to testify, and I am pleased to answer any questions.

Attachment A:
Example of "Penny Jumping" and Problem of Executing Institutional Orders

A stock is quoted at $20.00 - $20.20 on the NYSE. ABC mutual fund places a limit order to buy 50,000 shares of a stock at $20.00 on the specialist's book. A trader at XYZ mutual fund now gets a sell ticket from a portfolio manager for 50,000 shares of the same stock and the trader at that fund enters a sell order for 50,000 shares at $20.00. The specialist and the brokers in the crowd see that 50,000 shares are about to trade at $20.00 and a floor broker chooses to "price improve" the XYZ Fund to $20.01 and the XYZ Fund sells their stock. This process goes on for some time and eventually the best offer becomes $20.18. ABC Fund, now tired of continually being unable to buy stock at $20.00, enters a new order to buy his 50,000 shares at $20.18, at which point the same floor broker "price improves" them to $20.16 and sells them 50,000 shares.

The bottom line is that a trade that was about to happen between two institutions at $20.00 is broken up under the auspices of "price improvement." While XYZ Fund was price improved by a penny and made $500 for their shareholders, it cost ABC Fund's shareholders $8,000 more to execute their trade (with the floor broker making $7,500 in the process). In addition, while ABC Fund provided a benefit to the marketplace by placing a limit order on the Exchange and setting the best bid, they derived none of the benefit.

INVESTMENT COMPANY INSTITUTE

ATTACHMENT B

CRAIG S. TYLE
GENERAL COUNSEL

March 1, 2001

Mr. Richard A. Grasso
Chairman
New York Stock Exchange
11 Wall Street
New York, NY 10005

Dear Mr. Grasso:

The Investment Company Institute[1] is writing in connection with certain problems that mutual funds and other institutional investors have faced when trading on the New York Stock Exchange. As you know, since the implementation of decimalization on the Exchange, the execution of large orders has been hampered by reduced depth of the Exchange's limit order book and by increased instances of market participants stepping ahead of orders by increments of as little as one penny.

Some market participants reportedly contend that the problems noted above have arisen solely as a result of decimalization and are suggesting either that decimalization be reversed, or that the Exchange establish a minimum trading increment of greater than one penny (*e.g.*, a nickel). We disagree. Decimalization, by itself, is not the problem. Rather, it has simply made more apparent the difficulties that mutual funds and other institutions commonly face when trading on the Exchange.

In order to address these problems, we strongly recommend that the NYSE implement certain changes that would facilitate the ability of mutual funds and other institutions to trade large orders on the Exchange. We recognize that the NYSE has developed a system specifically designed for these types of orders – Institutional XPress. Unfortunately, as discussed below, we do not believe that Institutional XPress, as presently constituted, will satisfactorily respond to the difficulties that institutions are experiencing. With certain changes, however, Institutional XPress could achieve its objectives and, in turn, allow all investors in NYSE-listed securities to reap the benefits of decimalization.

Our specific recommendations are set forth below. As a preliminary matter, we wish to stress the point that, while mutual funds are correctly viewed as institutional investors because they frequently execute large-sized orders, mutual funds do so on behalf of millions of predominantly middle-income investors. The median income of a U.S. mutual fund shareholder is $55,000.[2] Moreover, 45% of all assets in Section 401(k) retirement plans are

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[1] The Investment Company Institute is the national association of the American investment company industry. Its membership includes 8,414 open-end investment companies ("mutual funds"), 489 closed-end investment companies and 8 sponsors of unit investment trusts. Its mutual fund members have assets of about $6.937 trillion, accounting for approximately 95% of total industry assets, and over 83.5 million individual shareholders.

[2] *See* Investment Company Institute Mutual Fund Fact Book (40th ed.) at 46.

Mr. Richard A. Grasso
March 1, 2001
Page 2

invested in mutual funds.[3] Thus, the principal beneficiaries of our recommended changes will be middle-income Americans.

Institutional XPress

In approving the rules implementing Institutional XPress, the Securities and Exchange Commission stated that "the XPress system should encourage market participants, particularly institutional investors, to display orders of at least 25,000 shares, which may attract more order flow and increase the depth and liquidity of the Exchange's market to the benefit of investors and the public interest."[4] The Institute strongly supports this objective. Unfortunately, Institutional XPress, as currently structured, will do nothing to achieve it and instead represents a classic missed opportunity.

Our members consistently tell us that, without protection for large limit orders placed on the Exchange's limit order book and the assurance that they will be able to interact with those orders, they will be dissuaded from placing limit orders on the Exchange, thereby reducing the market's depth and liquidity. This effect has become more pronounced following the introduction of decimalization. In fact, preliminary data has shown that liquidity and depth in the market have already been reduced (reflected in a decrease in both the amount of limit orders on the Exchange and the amount of block trades being executed on the Exchange).

The Market Structure Report of the NYSE's Special Committee on Market Structure, Governance, and Ownership stated that, in connection with the introduction of decimalization, "[i]t is possible that unanticipated trading strategies may develop that will warrant or require adjustments to [the NYSE] initiatives or changes in regulation."[5] The Report has proven to be prescient, and the following changes to Institutional XPress are now warranted:

1. Eliminate the required displayed time for a quote to qualify as an XPress quote and reduce the number of shares required for quotes and orders to become XPress eligible. Under NYSE rules, an XPress quote is defined as a published bid or offer of at least 25,000 shares that is displayed at the same price for at least 30 seconds. An XPress order is defined as an order of at least 25,000 shares to be executed against a displayed XPress quote, or at an improved price.

The 30-second display requirement is unnecessary, and is especially inappropriate in today's fast-moving trading environment. In its order establishing XPress orders and quotes, the Commission stated that the 30-second requirement would provide brokers and non-XPress orders the opportunity to interact with the quote before it becomes XPress eligible. In practice, however, this delay will only serve to provide a "free look" to market participants who want to

[3] *See* Fundamentals: Investment Company Institute Research in Brief; Vol. 9, No. 2 (May 2000) at 7.

[4] Securities Exchange Act Release No. 43763 (December 21, 2000), 65 FR 83120 (December 29, 2000) at 83122.

[5] Market Structure Report of the New York Stock Exchange Special Committee on Market Structure, Governance and Ownership, p. 22.

step ahead of large orders. As a result, institutional investors, knowing that large limit orders on the book are not provided protection and are likely to be "penny jumped," have little, if any, incentive to place large limit orders on the Exchange. In this way, the required displayed time defeats the purpose of Institutional XPress. Eliminating it would reduce stepping ahead, and thereby attract order flow and increase the depth and liquidity of the market.

The number of shares required for quotes and orders to become XPress eligible also should be reduced. A significant portion of the orders that mutual funds and other institutional investors typically place on the Exchange for execution are below the 25,000 share threshold established by the NYSE for Institutional XPress, especially in the case of smaller cap stocks. Therefore, many of the types of orders in which the XPress system was intended to facilitate trading will not be covered under the current rules. Reducing the number of shares required for a quote and order to become XPress eligible would encourage the placement of more orders on the Exchange's limit order book, further enhancing the liquidity on the Exchange.[6]

2. ***Make XPress orders ineligible for price improvement, i.e., XPress orders should not be represented by the specialist to the crowd.*** Under Institutional XPress, a specialist must represent an XPress order to the crowd prior to that order executing against an XPress bid or offer on the book. The practical effect of this requirement is that while the XPress order (*i.e.*, the responding order) may receive price improvement (which could be by as little as one penny in a decimal environment), the large limit orders comprising the XPress quote go unexecuted. Thus, in its desire to ensure that the institution *responding* to an XPress quote receives price improvement, the NYSE has created a regime that strongly discourages the entry of those orders that would comprise the XPress quote in the first place. For this reason, those institutions, including mutual funds, that would receive the "benefit" of this price improvement would gladly forego it. Our members report that it is far more important for them to receive protection for their displayed orders. Consequently, notwithstanding the NYSE's commitment to continuing to offer price improvement for smaller, retail orders, the Exchange should revise Institutional XPress so that XPress orders placed by institutions would not be required to be represented by the specialist to the crowd. This would promote the placement of limit orders on the book by providing protection for, and rewarding the placement of, those orders.[7]

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[6] The Institute recognizes that the Exchange has indicated that it may, in the future, reduce the minimum size for XPress orders and quotes to 15,000 shares and reduce the minimum required display time for XPress quote designation to 15 seconds. We believe, however, that these types of changes are crucial to the workings of Institutional XPress and should be made *prior* to the implementation of the system. In addition, for the reasons noted above, we do not believe that *any* minimum required displayed time is appropriate.

[7] The Institute also recommends that the NYSE eliminate the 3:58 p.m. cut-off time for entering XPress orders, because the cut-off, the purpose of which is to allow sufficient time for a specialist to represent the XPress order to the crowd for price improvement, would no longer be necessary if XPress orders were ineligible for price improvement.

Mr. Richard A. Grasso
March 1, 2001
Page 4

3. ***Allow XPress orders to reach through to orders on the book below the best bid and offer and require all orders on the book at prices better than those orders to be executed and price improved.*** Decimalization has led to an increase in the number of price levels at which orders are entered, as well as a decrease in the volume represented at each price level. Consequently, in order to ensure that Institutional XPress will offer mutual funds and other institutions the ability to execute large orders on the Exchange, the XPress system should allow those institutions to reach through to orders on the book that are below the best bid and offer. For example, if a large limit order (at a size that is XPress eligible) is located two price levels below the best bid or offer, an incoming XPress order should be able to reach through and hit that limit order. In order to ensure that bids or offers on the book that are superior to the XPress eligible quote are protected, and to be consistent with the Exchange's desire to provide price improvement opportunities to smaller orders, we would further recommend that all orders on the book at prices better than the XPress eligible quote be required to be executed and price improved to the price of the XPress quote in these circumstances.[8]

* * * * *

By enhancing Institutional XPress in the ways set forth above, the NYSE could help ensure that all investors – including millions of mutual fund shareholders – will realize the full benefits of decimalization. We therefore strongly encourage the Exchange to make these changes. We would be pleased to discuss our recommendations with you further. If you would like to do so, or if you have any questions regarding this letter, please contact the undersigned at (202) 326-5815 or Ari Burstein at (202) 371-5408.

Sincerely,

Craig S. Tyle
General Counsel

cc: The Honorable Laura S. Unger, Acting Chairperson
The Honorable Isaac C. Hunt, Jr., Commissioner
The Honorable Paul R. Carey, Commissioner
Annette L. Nazareth, Director, Division of Market Regulation
Robert L.D. Colby, Deputy Director, Division of Market Regulation
Paul F. Roye, Director, Division of Investment Management
Securities and Exchange Commission

Catherine R. Kinney, Group Executive Vice President
Edward A. Kwalwasser, Group Executive Vice President
New York Stock Exchange

[8] In order to implement this change, it will be necessary for the Institutional XPress rules to allow a quote below the best bid or offer to become XPress eligible and for the definition of XPress order to be amended to eliminate the requirement that an XPress order be for no more than the displayed size of an XPress quote.

PREPARED STATEMENT OF ROBERT B. FAGENSON

VICE CHAIRMAN, VAN DER MOOLEN SPECIALISTS USA, LLC
VICE CHAIRMAN OF THE SPECIALIST ASSOCIATION OF THE NYSE

MAY 24, 2001

I am Robert B. Fagenson, Vice Chairman of Van der Moolen Specialists USA, LLC, a New York Stock Exchange ("NYSE") specialist firm. I appear before you today in my capacity as a specialist.

On behalf of the Association, I want to express my thanks for this opportunity to testify before the Subcommittee on the effects that "decimalization"—that is, changing the typical trading increment for securities from sixteenths to pennies—has had on our securities markets.

In April 1997, I had the pleasure of testifying before the House Subcommittee on Finance and Hazardous Materials concerning H.R. 1053, "The Common Cents Stock Pricing Act of 1997." That bill, which was never passed, would have required the Securities and Exchange Commission ("SEC") to adopt a rule that would replace trading in fractions with trading in decimals. The bill also would have left it to the SEC to decide the minimum number of cents per share that should characterize bid and offer quotations for stocks and last sale reports for those securities in our markets. The primary purpose of The Common Cents Act and the move to decimal trading was to reduce the "spread" between bid and offer prices for securities. The spread was widely regarded as excessive and as a cost visited on public investors that was not subject to the moderating force of competition. Creating more pricing points in each dollar of stock traded (potentially one hundred compared to the sixteen that characterized traditional trading fractions in our markets), according to theory, would enhance price competition among traders and thereby reduce spreads and lower the costs that they represented. In short, fixed minimum fractional spreads were said to punish investors and reward traders. A beneficial side effect of eliminating fractional trading increments was supposed to be elimination of "payment for order flow," a practice whereby a market maker or market pays money—a cent or more per share—to a broker to, in effect, "buy" that broker's flow of customer orders.[1]

Imagining then that the worst that could happen as a result of a change to decimal trading would be a reduction in the trading increment to as little as a penny, we predicted in 1997 the following:

1. We believed that decimalization and any consequent narrowing of spreads between bid and offer prices would reduce the profitability of payment for order flow and internalization of retail orders in listed stocks. We think that this has occurred, but not to such a degree as to eliminate either payment for order flow or internalization—both of which we regard as bad practices.

2. We thought that decimalization would tend to reduce the ability of regional stock exchange specialists that trade NYSE stocks to do so. We also think that this is happening.

3. We said that decimalization, especially if the trading increment was reduced to a penny, would incent on- and off-floor market professionals to trade for their own accounts ahead of customers by stepping in front of their orders by a single penny. This, too, has happened. "Stepping ahead" has acquired a bad name in today's markets even though it improves the price for the other side of the trade—something that those who characterize the practice seem to forget, focusing only on the disappointed would-be buyer or seller and not at all on the "improved" other side of the trade. We observe that "stepping ahead" of (or "pennying") customers almost always seems to involve trading by market professionals, including institutional traders, rather than specialists and market makers, at least in the exchange markets. Market professionals acknowledge that they engage in this practice, even though they dislike it, because they believe that their responsibilities force them to do so in a penny-increment trading environment.

4. We pointed out that decimalization would reduce transparency in our markets by cluttering bid-offer quotation displays with short-lived bids and offers for small amounts of shares that would flicker in and out of existence too rapidly to permit public customers to take advantage of apparent price improvements. Further, we said that the overall effect would be to make the actual prices of stocks more difficult to determine by increasing the number of trades displayed on the consolidated

[1] The SEC considered banning payment for order flow in 1993. Ultimately, however, and wrongly, in our view, the SEC decided to permit it to continue so long as the practice was disclosed to brokerage customers whose orders were being sold. See SEC Release Nos. 34–33026 (October 6, 1993) and –34902 (October 27, 1994).

tape at very small price changes. This prediction also has come true—and to an even greater extent than we anticipated in 1997.

5. Finally, we predicted that, if spreads were significantly reduced, the sizes displayed to the markets in connection with prevailing bid and offer prices also would be reduced. This, too, has occurred, and to a much greater degree than we foresaw in 1997.

Collectively, we think that the most severe and adverse of the effects that have been engendered by decimalization have been these:

1. The significance of the pricing information available to public investors and market professionals—namely, last sale reports and displayed bid and offer quotations—has been blurred. This is because, with one hundred pricing points are available for each dollar of stock traded instead of the sixteen that existed when we traded in fractions, stock prices now change much more rapidly, and because the amount of stock available to be bought or sold at any single pricing point is much smaller than was the case when fewer pricing points were available.

2. There has been a loss of predictable and visible liquidity at the prices of displayed bids and offers (in the form of quotes with size). This has happened because interest in buying or selling is spread out among more of the possible pricing points than was the case when there were fewer of them, and because, since only the highest bid and lowest offer in each market is widely disseminated, the degree of liquidity, or the lack of any liquidity, at prices away from the best bid and offer prices is hidden.

3. There now is a trend toward trading in increments as small as 1⁄100 of a cent or $.0001. So far, this phenomenon has been confined to trading in over-the-counter ("OTC") stocks, where visible liquidity is now significantly lower than it was in a fractional trading environment. The adverse effects of such trading have been partially obscured by the fact that the NASD's mechanisms for disseminating consolidated last sale and bid and ask information in OTC stocks are not yet capable of showing prices in increments smaller than a penny. Display of actual four-decimal place prices (or even smaller increments), we believe, would sharply amplify these negative effects.

In our view, the foregoing factors indicate that trading stocks in penny increments may have confused and disadvantaged public investors rather than helped them. Spreads may have been reduced, but investors cannot put those "saved" spread increments in their pockets. Instead they find that, in a penny-trading environment, even modestly sized buy and sell orders are sometimes broken into three or four separate parts before they can be filled—and that those parts are filled at different prices. In addition to getting different prices, this usually also involves increased clearing costs for the customer. This did not occur when we traded in fractions. Before the change to decimals, orders of modest size did not move market prices away from the levels that prevailed before those orders were entered in the market. These costs, unlike the supposed savings inherent in "reduced spreads," are readily understood by all.

How did we get to where we are from a well-meaning effort to make stock trading more understandable and less expensive for the public? Most investors, we would think, like everyone else, really would rather do away with pennies altogether, rather than be forced to carry and use them—though we all do. No one at all, however, carries mills or tenths of mills in their pockets or can be expected to think rapidly in terms of such units. Can it be said that a price of 10¼ is harder to understand than a price of $10.2639? We think not.

The Association believes that adjustments can be and are being made to overcome the problems that have attended the movement from sixteen pricing points for each dollar in fractional trading to one hundred such points in a penny trading environment. For example, investors are learning that the smaller sizes associated with each such pricing point displayed as part of a quotation can be and often are quickly exhausted, forcing prices to the next higher or lower level. As a result, investors are finding that it makes sense to place a limit or "cap" on the prices they are willing to pay or accept when they buy or sell and to confer discretion on their brokers to work within the cap to fill their orders. This trading process, however, and the diminished liquidity available at any particular pricing point, may well result in average prices for investors above the lowest offer or below the highest bid displayed at the time their orders were entered in the market.

Under these circumstances, are investors paying more to buy stock or getting less when they sell stock than was the case before the introduction of decimal trading? We have no data to support a conclusion in this regard. At the same time, because sizes associated with displayed bids and offers seem to us to be so much smaller than they were in a fractional trading environment, it is entirely possible that it has become more expensive, on the whole, for ordinary investors to transact than formerly was the case.

Our final concern—reduction of the trading increment below one penny—is our most serious one. Reduction of the trading increment below a penny, in our view, could damage the integrity of the markets' pricing function and undermine public confidence in the fairness of our markets. This could occur because trading in tiny, sub-penny increments will even more completely obscure the true state of the market as it is seen by individual and institutional investors alike, as liquidity at particular price points is buried beneath very small size amounts associated with momentarily higher bids or lower offers. In turn, this effect can be expected to increase investor uncertainty as to the price at which a buy or sell order of any substantial size can be executed and to increase buyers' and sellers' anxiety that their intentions will become known to the market before their orders can be filled. Last, because of the spray of prices resulting from sales in increments smaller than a penny, confidence that any particular price is "the" price at the moment will be sapped.

Our securities markets are acknowledged by all to be the most powerful engine for the raising of capital ever conceived. Risking the basic pricing and trading mechanisms of that engine and public confidence in them by allowing the uncontrolled splintering of the prices at which stocks trade and in which bids and offers are made is worse than foolish: it is dangerous.

For the foregoing reasons, we urge the Subcommittee to consider legislation that would not only empower the SEC, but also require that agency, to determine appropriate trading increments for different categories of stocks (that is, actively or thinly traded, highly capitalized or less robust, and so on) and to adopt an appropriate rule that would compel the markets and broker-dealers to adhere to those increments in the trading of securities. In 1997, we thought that it would not be necessary to ask for government assistance to deal with the consequences of decimalization. Experience with decimals to date, however, has persuaded us that we were wrong and that such assistance is badly needed now. We are unsure whether the SEC has authority today under the Securities Exchange Act of 1934 to adopt particular trading increments. We are confident, however, that, with the help of the securities industry and academicians, the SEC will be able to develop a rational limit on what now is a dangerously uncontrolled process of endlessly splintering the trading increment.

I would be pleased to respond to questions.

RESPONSE TO WRITTEN QUESTIONS OF SENATOR ENZI FROM LAURA S. UNGER

Q.1. At the May 24, 2001, Subcommittee hearing I asked you about the status of the Commission's consideration of repealing or significantly revising the Short Sale "Uptick" rule. You stated that the Commission would be coming out with a proposal shortly. I note that the Commission's semiannual regulatory agenda, published May 14, 2001, in the *Federal Register*, states that the Commission expects to publish a notice of proposed rulemaking (NPRM) on the Short Sale Rule by the end of May 2001, which is this month. Please clarify for the Subcommittee the Commission's time frame for issuing the NPRM.

A.1. We anticipate that the staff's recommendations on possible revisions to Rule 10a–1 will be ready for the Commission to consider by late summer.

Q.2. In addition, it is my understanding that several commenters to the October 1999 SEC concept release on revision or repeal of the Short Sale Rule believe that the rule should be repealed in its entirety. Decimalization further reduces the economic justification for retention of the Short Sale Rule. Is the SEC considering a repeal of the Short Sale Rule, or merely a revision to the rule?

A.2. As you note, the Commission in 1999 published a concept release seeking comment on Rule 10a–1. The concept release sought comment on eight concepts related to the regulation of short sales of securities, including eliminating Rule 10a–1. The comments received in response to the concept release were mixed. A few commenters (9 out of a current total of 2,577) advocated repealing the rule altogether, while others favored retaining the rule with modifications. The majority of the comment letters were delivered electronically by individual investors calling for extending short sale regulation to cover nonexchange listed securities, such as Nasdaq Small Cap, OTC Bulletin Board, and Pink Sheet securities. The staff is currently developing a proposal on the Short Sale Rule for the Commission's consideration. It would be premature to comment in detail on what that proposal will be until the Commission has had a chance to consider the staff's recommendation.

The staff does intend, however, to recommend that any proposal address the issue of decimalization. While the staff believes that it may be premature to say that decimalization has further reduced the economic justification for retention of the Short Sale Rule, decimalization raises at least two other distinct questions regarding the operation of Rule 10a–1. The first is the extent to which the reduction in the minimum price increment from $1/16$ (6.25 cents) to a penny makes it more difficult to comply with the rule, due to rapid trade and quote price changes. The second question is, in a decimals environment where price differences between trades can be a penny (or less), how much above the last sale (or bid) should a short sale be executed in order to achieve the goals of the rule. The staff intends to recommend that the Commission inquire in the proposing release regarding the effects of decimal-ization on the Short Sale Rule and will recommend regulatory changes, as necessary.

Any short sale proposing release will be designed to attract constructive input from a broad range of market participants, and will encourage commenters to supply data to support their views. We hope that these responses will assist our understanding of both the costs and benefits of the current Short Sale Rule. We will study the comments and any accompanying data to improve the regulation of short selling.

RESPONSE TO WRITTEN QUESTIONS OF SENATOR ENZI FROM CATHERINE R. KINNEY

Q.1. At the May 24, 2001, Subcommittee hearing there was some discussion regarding the SEC revising or repealing the short sale uptick rule. The SEC indicated at the hearing that they will be issuing a proposed rule on revising or repealing the Short Sale Rule in the very near future. The consensus seems to be that the Short Sale Rule should be scaled back, if not totally repealed. Do you believe that the rule has any continued economic or policy justifications? If so please identify the market capitalization and trading volume thresholds, as well as other criteria, which you believe are appropriate.

A.1. The New York Stock Exchange does not favor elimination of the Short Sale Rule. We continue to believe that this rule provides important safeguards in protecting the public interest and in maintaining an orderly marketplace. The rule continues to offer appropriate regulatory safeguards for allowing short-selling in a rising market, while prohibiting short-selling from being used to accelerate a declining market. The elimination or modification of the rule could have the effect of encouraging short-selling activities in which the price of a security could be manipulated. We also understand that companies that have listed their securities on the Exchange favor the retention of the rule.

If the SEC issues a proposed rule to revise or repeal the Short Sale Rule, the Exchange will comment on such a specific proposal at that time.

Q.2. In your testimony, you indicate that price improvement on the New York Stock Exchange has increased, particularly for smaller orders. Please explain how the NYSE measures price improvement.

A.2. When placing a market order, there is an expectation that the order will be filled at the current best bid or offer—for example, the quote. The NYSE measures price improvement by comparing the actual price with that quote. The statistics are further summarized in categories by order size.

Published along with the quote is the number of shares available to buy or sell at that price. When calculating price improvement numbers, the NYSE does not include orders that exceed the published size. We do not calculate the statistics for stocks with a per share price above $1,000, or stocks trading in round lots of less than 100 shares, and we exclude odd lots from our calculations.

In May 2001, 47 percent of all orders executed on the Exchange received price improvement. The Exchange publishes best execution statistics each month on our website, www.nyse.com.

Q.3. The Investment Company Institute, in a March 1, 2001, letter to Mr. Grasso, Chairman of the New York Stock Exchange, has requested changes to the functioning of Institutional Xpress to "facilitate the ability of mutual funds and other institutions to trade large orders on the Exchange." What are the drawbacks, if any, to implementing the changes requested in the letter, such as the 30-second requirement and the automatic execution of large orders? Would anyone be disadvantaged by these proposed changes?

A.3. We believe that some of the changes requested by the Investment Company Institute would increase volatility by diminishing the ability of all orders to participate in the auction market. It is important to have a mix of institutional and retail order flow in the price discovery process, and to ensure that both institutional and retail orders receive the best price through the same auction process. We need to gain experience with Institutional XPress, and we will be reviewing the suggestions submitted by the ICI and other market participants.

We have, however, taken some action in accordance with discussion in the Exchange's initial rule filing for the approval of Institutional XPress. We stated at that time that certain changes were to be considered within 6 months after the initial implementation of the XPress product. On June 11, 2001, the Exchange filed with the SEC a proposed rule change relating to Institutional XPress quotations and orders. The rule filing proposes to reduce the minimum size of an XPress quote from 25,000 shares to 15,000 shares; reduce the time period for designation as an XPress quote from 30 seconds to 15 seconds; and reduce the minimum size of an XPress order from 25,000 shares to 15,000 shares. This current rule filing, which has not yet been acted upon by the SEC, is in accord with our previously expressed intention.

Q.4. During his testimony before the Subcommittee, Peter Jenkins of Zurich Scudder Investments expressed some concern about trading on the NYSE. He mentioned that the one cent MPV has hampered the ability of institutional investors to obtain executions on the NYSE floor, because market participants can step in front of any order, for as little as one cent price improvement.

Mr. Jenkins testified that the problem institutional investors face is due to the lack of control they can exercise over the trades they send to the floor, for example, since trades are exposed to the floor crowd, large institutional orders do not receive "sufficient protection" and can be broken up. Please respond to these comments by Mr. Jenkins. In particular, please address whether the NYSE floor specialists are the market participants who are stepping in front of institutional investors' large block trades.

A.4. While there may be a perception that specialists are stepping ahead of customers at a minimally improved price (commonly referred to as "pennying"), in fact a recent study shows that two-thirds of such "one-tick-better" trades are by nonspecialists. The vast majority (about 85 percent) of "pennying" quotes appear to arise from system limit orders. The facts suggest that, contrary to reports in the press and elsewhere, in the large majority of trades NYSE's floor specialists are NOT stepping in front of institutional investors' large block trades.

This study, "Getting 'Pennied': The Effect of Decimalization on Traders' Willingness to Lean On the Limit Order Book at the New

York Stock Exchange," is attached and can also be found on our website, www.nyse.com.

Nevertheless, the NYSE has taken steps to assuage the concerns of institutional investors. The NYSE has recently taken action to address the ability of institutional investors to execute large transactions at a single price. In early June, our Board approved an amendment to our Rule 72(b) to provide that a specialist may not effect a proprietary transaction to provide price improvement to either side of a "clean cross" transaction. The proposed amendment will preserve the auction market principle of price improvement since orders sent in from off the trading floor and placed with the specialist or a floor broker may offer price improvement at any minimum variation. This proposed rule change was filed with the SEC on July 2. The NYSE has taken these steps to reassure this important segment of the market of the integrity of our floor-based auction market.

Getting "Pennied":
The Effect of Decimalization on Traders' Willingness to Lean On the Limit Order Book at the New York Stock Exchange

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Getting "Pennied"
The Effect of Decimalization on Traders' Willingness to Lean On the Limit Order Book at the New York Stock Exchange

Abstract

Theory suggests that decreasing the minimum price variation (i.e., the tick size) in which financial securities trade will increase the frequency of trades and quotes one tick better than existing quotes and that professional traders are more likely to engage in this "pennying" behavior than public traders. We use proprietary NYSE data around the implementation of decimal pricing to examine the occurrence of trades and quotes one tick better than existing quoted prices. We find that the proportion of trades bettering existing decimal quotes by one cent exceeds one-third the frequency of quotes bettering existing fractional quotes by $0.0625 (the old tick size) and that the number of quotes improving existing decimal quotes by one penny exceeds the number of one-tick-better fractional quotes by the end of the sample period. Although the specialist more frequently participates in trades one tick better than existing quotes after decimalization, other parties are involved in two-thirds of one-tick-better trades. About 85% of pennying quotes are associated with the arrival of a system limit order both before and after decimal pricing. The primary source of these one-tick-better quotes, however, changes in the months following the shift to decimal pricing from agency orders to principal orders. Furthermore, by the end of the sample period, a larger proportion of the pennying quotes originate from a smaller number of member firms than in the fractional environment.

Introduction

The optimum minimum price variation for trading financial securities has been the topic of much debate recently. A small minimum variation (tick size) encourages price competition among liquidity suppliers, which can reduce the quoted spread and lower investors' trading costs. However, a small minimum price variation also makes it less expensive for traders to step in front of displayed liquidity (i.e., to lean on the limit order book). Suppose, for example, that a public limit order bidding $20.00 is the best (highest) bid on the book. When the minimum price variation was $1/16, anyone wishing to gain priority over that standing order was required to better the price by $0.0625 per share. Now, the second-mover need bid only $20.01 (either in the form of a limit order or an oral bid on the exchange floor in time to interact with a market order). Furthermore, should the $20.01-bidder decide that owing the stock is not a good idea after acquiring it, he or she can sell into the original $20.00 bid, losing only $0.01 per share. If liquidity suppliers are disadvantaged frequently enough, then they might choose to not display their trading interests. This decrease in displayed liquidity, in turn, potentially injures market quality.[1]

This paper examines the frequency and source of trades and quotes priced one tick better than existing quotes for a sample of NYSE-listed stocks converting to a penny minimum price variation on January 29, 2001. In the (new) vernacular of Wall Street, the individuals initially choosing to display their interest to trade are "pennied" by the quotes/trades one tick better than their quotes.[2] Articles in the financial press (e.g., Wall Street Journal [2001a], Financial Times [2001], New York Times [2001], Wall Street Journal [2001b], and Investor's Business Daily [2001]), suggest that institutional traders believe this is a serious problem. We examine cases of sell (buy) orders in the sample securities executing on the New York Stock Exchange with an execution price one tick better than the existing National Best Bid (Offer) quoted price during the week before the change to decimal pricing, the week immediately following the change to decimals, the fourth week of decimals, and three months after the switch.[3] Our conclusions in this area are consistent with Edwards and Harris (2000), who analyze the change in the minimum price variation from $0.125 to $0.0625. Specifically, we find that the specialist frequently participates in trades one tick better than existing quotes and that this frequency increases when

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[1] See Harris (1997, 1999) for more detail regarding this argument. Ahn, Cao, and Choe (1996), Bacidore (1997), Bollen and Whaley (1998), Goldstein and Kavajecz (2001), and Porter and Weaver (1997) are examples of work that examines previous reductions in tick size.

[2] We use the terms "pennied" and "pennying" for the one-tick-better trading or quoting regardless of the minimum price variation. Thus, we avoid the terms "'teenied" and "'teenying".

[3] The NBB(O) is determined by taking the highest bid (lowest offer) price across all market centers quoting a particular security.

the minimum price variation is reduced to a penny. However, the specialist is not involved in a majority of the pennying trades and it appears that the specialist only facilitates other pennying trades. We also identify instances in which a quote update from the New York Stock Exchange (NYSE) betters the existing National Best Bid or Offer (NBBO) price by one tick. We divide these pennying quotes into instances where one or more limit orders (in the stock of intrest, on the correct side of the market, and at the appropriate limit price) arrive at the NYSE just prior to the quote revision and those instances where the quote revision is not preceded by such a limit order. The vast majority (about 85%) of pennying quotes appear to arise from limit orders. Three months after decimalization, the majority these pennying limit orders switch from agency orders to principal orders. This is consistent with Harris' argument that the lower minimum price variation plays into the hands of professional traders. Furthermore, two firms account for almost one-third of the pennying quotes in the final week of the sample.

1.0 Data

Decimalization on the NYSE occurred in four stages. Seven stocks, traded by a one specialist converted to decimal pricing on August 28, 2000. An additional 57 securities followed on September 25, 2000. The final pilot involved 94 more securities that began trading in pennies on December 4, 2000. All remaining securities converted to decimals on January 29, 2001. We choose 148 securities from the final group to be decimalized as our sample. Fifty of these securities are the most actively traded (highest share volume) securities that are not part of the decimal pilot program. We also randomly select 25 securities from each of four volume:price categories. To select the 100-stock random sample, we first rank all NYSE-listed securities on share trading volume and, separately, on average NYSE trade price during the month prior to January 29, 2001. Each security is placed in one of four categories after comparing its share price to the median NYSE share price and its trading volume to the median NYSE trading volume. These four groups (of unequal numbers of stocks) are a high-volume:high-price group, a high-volume:low-price group, a low-volume:high-price group, and, a low-volume:low-price group. Within each group we arrange securities alphabetically (by symbol) and choose every Nth security, where N is chosen to select 25 securities from that group. Because two of the 50 stocks with the highest trading volume also are randomly chosen as part of the high volume groups, our final sample has 148 unique securities. The sample securities are listed in Table 1.

We examine four one-week time periods. The first is the week prior to decimals, January 22-26, 2001. During this week, all of the sample securities trade in $0.0625 increments. The second and third sample periods are the first and fourth weeks of decimal trading; January 29 through February 2 and February 20-26, respectively. Finally, we examine the last full week in April, April 23-27, a week approximately three months after decimal trading begins.

To examine "pennying" behavior, we identify instances of penny trading and instances of penny quoting. NYSE penny trading is defined as a NYSE trade occurring at a price one tick ($0.0625 in the pre-decimal period and $0.01 otherwise) better than the relevant side of the NBBO quoted price when the NYSE's quoted price equals the relevant NBBO price. For buy (sell) orders, the relevant side of the quote is the NBO (NBB) price. Suppose that the NYSE's bid and the NBB are $20.00 and that the NYSE's offer and the NBO are $20.25. A NYSE buy order filling at $20.24 ($20.1875 in the fractional world) is a pennying trade. Likewise, a NYSE sell order filling at $20.01 ($20.0625) is a pennying trade. The trader(s) displaying trading interests at $20.00 and $20.25 did not interact with the opposite-sided order. Penny quoting is defined as a quote revision coming from the NYSE that improves the NBB(O) by one tick when the NYSE's quoted price equals the pennied NBB(O). In the above example, that is a NYSE bid at \$20.01 (\$20.0625) or a NYSE offer at \$20.24 (\$20.1875). Although this action does not intercept an existing market order immediately, it stands ready to do so.

To identify instances of penny trading, we use the NYSE's System Order Database (SOD) and its accompanying quote file (SODQ). SOD contains the details of all NYSE system orders, including order information, details of execution(s) against that order, and any cancellation information. SODQ contains the NYSE quote and the best off-NYSE quote at order-arrival time. From these two quotes, we can determine the NBBO prices. Comparing the execution prices associated with buy (sell) orders to the order-arrival-time NBO (NBB), allows us to determine if the trade occurs at a price one tick better than the relevant quote. In order to detect pennying quotes, we use the Consolidated Quotation (CQ) file. The CQ file contains a complete history of all quotes emanating from each market center (the NYSE, the regional exchanges, and the National Association of Security Dealers InterMarket). From this, we construct the NBBO. With the NBBO in place, we identify instances in which a NYSE quote update improves one or both quoted prices by a single tick. These are instances of pennying quotes. With SOD, we can determine whether an appropriately-sided NYSE system limit order in that security with a limit price equaling the updated NBBO arrived just prior to the quote update.

2.0 Pennying Trades

We use the SOD(Q) data to identify trades occurring at prices one tick better than the order-receipt-time NBBO (the NBB for sell orders and the NBO for buy orders). We report the total number of trades and the number of pennying trades in Table 2.

Clearly, the fourth and thirteenth weeks of decimal trading are more active trading weeks than the pre-decimal week and first week of decimals for the sample stocks. During the week when the sample securities trade in fractions, 27% of NYSE trades (16% of shares) occurring when the NYSE is part of the NBBO execute at a price $1/16 better than the relevant side of the order-receipt-time NBBO quoted price. It is not surprising that a smaller portion of shares than trades receive improved prices because small orders typically have higher price improvement rates than large orders (e.g., Bacidore, Battalio, and Jennings [2001]). After decimal pricing, about 10% of the trades (8% of the shares) execute at prices $0.01 better than the NBBO. The fact that relatively fewer trades and shares receive one-tick price improvement in the decimal environment is consistent with the idea that traders providing price improvement can access more price points with decimals than with fractions. To the extent that one expects price improvement to be distributed uniformly across all of the price points, the fact that over one-third of the previous level of one-tick price improvement is concentrated at $0.01 suggests an increased level of pennying in the decimal environment. It might, however, be natural to expect that more price improvement would occur at $0.01 than, for example, at $0.06. Combined with the rows detailing the frequency of trade prices from two to six cents better than the NBBO, the pennying trade fractions indicates that about the same relative frequency of trades occurs inside the spread by the old minimum price variation of $0.0625. That is, adding the frequencies of one through six cents post-decimal price improvement provides about the same level of price improvement as occurs at $0.0625 in the the pre-decimal world (approximately 27%).

Of particular interest in these "pennying" scenarios are instances in which the relevant side of the quote has substantial size. This large size suggests that the trader stepping ahead of the quote will have little trouble reversing the trade should that action become necessary. In

Panel B of Table 2, we examine the frequency of penny trading when the quoted size on the relevant side of the existing quote (bid for sell orders and offer for buy orders) is greater than or equal to 10,000 shares (an arbitrarily selected number). Given the decreased quoted depth associated with decreases in the minimum price variation, it is not surprising to find fewer total trades occurring when the quoted size is 10,000 shares in the decimal world than in the fractional environment. Given previous work documenting the decreased quoted depth after reductions in tick size (e.g. Goldstein and Kavajecz [2000] and Chakravarty, Harris, and Wood [2001]), it is not surprising to find fewer instances of trades occurring when the quoted size exceeds 10,000 shares after decimalization. Large quotes in the post-decimal era are more frequently pennied than quotes with less size, implying that the decrease in the one-tick improvement rate associated with the switch to decimal pricing is relatively less for the quotes of size than overall. Overall, the decimal pennying rate is less than one-half the one-tick-improvement rate in the fractional trading environment (36% for trades and 48% for shares), but the large-size pennying rate in the decimal world exceeds 50% of the fractional pennying rate (55% for trades and 63% for shares). Thus, the rate of observing trades one tick better than the relevant quote is greater for quotes of size than for quotes with little size. Furthermore, the pennying rate for large-size quotes is proportionally greater in the decimal environment than in the fractional environment. The total fraction of trades occurring at six or fewer cents better than the existing quote in the post-decimal sample periods is at least as great as the fraction of trades occurring $0.0625 better than the existing quote in the pre-decimal period.

Finally, we turn to the issue of who is trading one tick better than quoted prices. For this, we focus on the specialist's participation in these trades. In particular, we determine if the specialist participates as a counter-party to these trades in a principal position. That is, does the specialist "penny" the order for his own account? We distinguish between situations in which the specialist is the only counter-party to a pennying trade and situations in which the specialist is one of multiple counter-parties. In the latter cases, the specialist might be acting as a trade facilitator. We summarize the results of this investigation in Table 3 where we report the fraction of one-tick-ahead trading done by the specialist alone and the portion done by the specialist with other counter-parties.

In Panel A, we examine all NYSE trades occurring one tick inside the relevant national best quoted price when the NYSE's quote equals that national best price. Of the pre-decimal sample period trades occurring $1/16 inside the NBBO (reported in Table 2), the specialist is the sole counter-party in 28.11% of the cases. The specialist is one of multiple counter-parties in an additional 6.00% of these trades. Thus, there is a non-specialist counter-party to pennying trades in 72% the trades (80% of the shares). Upon the shift to decimal pricing, the specialist becomes a more active participant in the trades one tick better than the quote. Assuming the first week of decimals represents an "adjustment period," the specialist is the only counter-party in these trades for about one-third of the trades in the decimal world (compared to 28% of the fractional cases). In addition, the specialist participates in a pennying trade as one of multiple counter-parties in 8-9% of the cases. Thus, we find a non-specialist counter-party for about two-thirds of the pennying trades (73% of the shares) during our final two sample periods. This compares to 70% of the trades (80% of the shares) in the fractional period.[4] Examining shares instead of

[4] The vast majority of the counter-parties other than the specialist are "LMT", indicating a limit order. This is either a limit order at the execution price (or worse) arriving nearly simultaneously with an opposite-sided market order. In those cases, the special can execute the order at the limit price (or better) without displaying it. However, the most likely scenario is that the specialist is executing a CAP (or percentage or participating order). These are

trades, we find (not surprisingly) that the specialist trades alone in the smaller trades and that his role as a facilitator is more prevalent in the larger trades. As a fraction of shares, there is a non-specialist counter-party in about 73% of the cases post-decimals compared to nearly 80% pre-decimals. Panel B indicates that examining only quotes of size produces similar results.

To summarize, we find that the proportion of trades occurring one tick better than the relevant side of the NBBO falls after decimal pricing is introduced. This proportion, however, does not fall to one-sixth of the pre-decimal proportion as we might expect if the amount of price improvement is distributed uniformly across the six price points comprising the previous tick (\$0.01 versus \$0.0625). Instead, one-tick price improvement is over one-third as frequent with decimals as with fractions. We find that the specialist participates in a greater proportion of the trades occurring one tick better than the relevant quoted price in the decimal environment. The proportion of the one-tick-better trades in which the specialist is the sole counter-party rises from just over one-quarter to about one-third after security prices are decimalized. Edwards and Harris (2000) provide a thorough analysis of the cost of this penny-trading behavior associated with the decrease in the tick size to \$0.0625. We now turn to the subject of penny quoting.

3.0 Pennying Quotes

Although trades one tick ahead of displayed trading interests deprive limit orders of the chance to interact with market orders, quotes one tick better than existing quotes decrease the priority of the initially displayed order. To the extent that Harris (1997, 1999) is correct, we expect that the instances of one-tick-better quotes will increase after decimal pricing. Because

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limit orders, many times marketable, requesting to be one-half of the volume. The specialist is to execute these orders at the most favorable price to the broker leaving the order, but traditional limit orders have priority. Thus, the specialist typically beats the best price on the limit order book by a penny and trades with the CAP order so as to allow the CAP order to be only one-half of the volume. This also is consistent with the specialist doing about one-half (52%) of the volume in this category of trade both before and after decimal pricing is introduced.

the cost of being wrong can be reduced to one penny (instead of \$0.0625), the quote pennier can be more bold in a decimal world than in a fractional environment.

We use the Consolidated Quote (CQ) file to identify NYSE quote updates bettering the existing NBBO by one tick when the NYSE is on the relevant side of the existing NBBO. The CQ file contains each of the disseminated quotes from all venues trading a particular security. We note NYSE quote updates improving either or both sides of the existing NBBO when the NYSE is part of the quote being bettered. To be included in our sample neither the existing NBBO nor the new NBBO can be locked (the national best bid price equals the national best offer price) or crossed (the national best bid exceeds the national best offer). Further, the quote update must be a valid (i.e., have non-zero prices and sizes and be a firm quote) post-NYSE-opening quote. Finally, the quote update cannot worsen the opposite side of the NBBO at the same time it betters one side of the NBBO. This eliminates instances of the market maker simply changing the quote to a new equilibrium price level.[5] We then examine SOD to determine if an appropriately-sided limit order with a limit price equal to the updated quoted price arrives at the NYSE in the 30 seconds prior to the quote update. That is, if the bid (offer) side of the NBBO in a particular stock is improved by one tick relative to the existing NBB (NBO), then we determine whether a buy (sell) limit order in that stock at that price arrives in New York in the preceding 30 seconds. We treat quote updates improving both sides of the NBBO as two separate cases and determine whether SOD contains orders on neither, either, or both sides. The 30-second screen is reasonable because the NYSE requires that limit orders be displayed within

[5] For example, suppose we find that the NBB increases from \$20.00 to \$20.01. This is a pennying quote. If the NBO changes from \$20.05 to \$20.07 at the same time, then this appears to be the NYSE specialist moving the stock to a new price level. This quote revision is not in the sample.

30 seconds of arrival and enforces that requirement with "quote assist" software that automatically displays the order after 30 seconds. If a limit order arrives in the 30-second window prior to a quote update, then that quote update is associated with a system limit order. If no such limit order arrives, then we presume that the new trading interest derives from the floor community (i.e., specialists and floor brokers).

In Table 4, we note the number of pennying quotes and the proportion of these quote updates apparently arising from system limit orders.

The number of NYSE one-tick improvements to the NBBO decreases in the first post-decimal sample period. In the second and third decimal sample period, however, the number of pennying quotes exceeds the number of one-tick-better fractional quotes (substantially so in the final sample period). This is consistent with a decimalization-induced increase in the level of quoting competitiveness across exchanges (see Chakravarty, Harris, and Wood [2001]) and among individual traders on the same exchange. Traders are more able and willing to better the quote when it costs only one penny instead of \$0.0625 to do so. The percent of one-tick quote updates improving both sides of the NBBO increases from about one percent of the quote updates to about five percent post decimals, emphasizing the increased competitiveness of the quoting environment. The fraction of one-tick quote changes associated with a system limit order decreases slightly immediately after decimal pricing begins; from 86% to 82%. However, the proportion of pennying quotes apparently arising from public limit orders *increases* relative to the pre-decimal period by our final sample period. This suggests that the floor community (i.e., specialists and floor brokers) does not take a *relatively* more active role in submitting pennying quotes with the smaller tick size. In each sample period, the new quote has substantially less size than the quote being pennied. Interestingly, the relative difference in size between the new and old quote is largest for the pre-decimal sample period (the new quoted size is only 28% as large as the old quoted size). The smaller quoted sizes in the decimal sample periods are consistent with other work finding that quoted size falls when the tick size is reduced (e.g., Goldstein and Kavajecz [2001] and Chakravarty, Harris, and Wood [2001]).

Once again, under the assumption that the temptation to penny quote is greater when the initial quoted size is large, we repeat the above analysis after requiring the initial NBBO have a quoted size of at least 10,000 shares on the relevant side. We report the results in Panel B. Consistently with the notion that quoted size decreases when the minimum price variation is reduced, there are substantially fewer post-decimal pennying quotes than pre-decimal pennying quotes when requiring that the initial NBBO have a large quoted size . Again, the fraction of the one-tick-better quotes improving both sides of the NBBO increases with the advent of decimal pricing. With the size restriction, the decrease in the percentage of orders one tick better than the NBBO apparently coming from the system falls a bit more in the first post-decimal sample period and does not recover to the pre-decimal level by the third post-decimal sample period. This suggests that the floor community slightly increases their relative penny quoting activity with the smaller tick size. Quoted size falls considerably with the quote update; the new quoted size is approximately 20% of the old size in each sample period.

Harris (1997, 1999) predicts that the decrease in tick size favors professional traders. Clearly, we categorize the floor community as professional traders. From Table 4, we find that the *proportion* of pennying orders apparently arising from the floor in the final sample period is little changed from the fractional world. To gauge whether there appears to have been a shift in the source of the pennying quotes arriving to the NYSE from off of the floor, we characterize the qualifying system limit orders (limit orders in the correct stock, with the correct limit price, and on the correct side of the market arriving in the 30 seconds prior to a one tick improvement in the NBBO) as being either agency or principal. We hypothesize that agency orders are likely to be public (non-professional) limit orders. Principal quoting, however, is more likely to be done by professional traders. Table 5 provides the results of this inquiry.

The first row in each panel of Table 5 provides the percent of pennying system orders (reported in Table 4) that are designated as agency orders in each sample period. After 3 months of decimal trading there has been a fundamental shift in the type of system orders improving the quoted price by one tick. In the pre-decimal sample, over two-thirds of these orders are agency orders. By April, less than one-half of the pennying system orders are agency orders. Another approach to examining this issue is to determine the percentage of the one-tick quote updates with at least one qualifying system limit order in the preceding 30 seconds with a principal designation. That fraction (displayed in the second row of Table 5), initially decreases. By the last full week in April, however, nearly 60% of the pennying quote updates are associated with at least one principal system order. Furthermore, by the final sample week, a small number of order-entry firms are submitting a larger portion of the pennying quotes. In the week of April 23-27, one firm submitts nearly 27% of the limit orders we associate with a one penny improvement in the NBBO. This suggests that a small number of off-floor firms are aggressively competing with posted quotes. In the pre-decimal sample period and the first week of decimal trading the difference between the size of all pennying quotes and the principal pennying quotes is not substantial. By the last sample decimal period, however, the average updated principal quote is associated with fewer shares. Panel B indicates that restricting the size of the pennied quote to be at least 10,000 shares has little effect on the results. (We do not report the concentration of pennying quotes by order-entry firm in order to conserve space, but do find the same firms involved in pennying the quotes of size.)

5.0 Conclusions

This paper documents the frequency of trades and quotes one tick better than the posted quoted price around the switch from fractional to decimal pricing and identifies the types of traders that participate in pennying trades and quotes. We find that the proportion of trades with execution prices one tick better than the posted quote falls as a fraction of all trades after securities are priced in pennies. The decrease, however, is less than the decrease one would expect if traders used all of the new price points equally in determining the prices at which they are interested in trading. The specialist is the sole counter-party to only about one-third of the pennying trades in the post-decimal world, while he is the sole counter-party to about 28% of the trades in the fractional trading environment. This suggests that the majority of pennying trades have a non-specialist counter-party. Pennying quotes are more numerous after prices are decimalized than before. The specialist does not take a relatively greater role in pennying quotes after the change to decimals. Pennying quotes do, however, appear to more frequently come from professional traders in the post-decimal market than in the fractional market. We cannot place a negative on the apparent increase in professional traders' activity. The data are consistent with the hypothesis that the smaller tick size enables these traders to more effectively compete with the floor community.

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Table 1

Sample Securities

Panel A. Fifty highest trading volume, non-pilot stocks

AIG	MOT
AXP	MRK
BAC	MU
C	MWD
CNC	NOK
CPN	NT
DIS	ONE
EIX	PCG
EMC	PCS
F	PFE
FNM	Q
GE	SBC
GLW	SCH
GPS	SGP
GX	AA
HD	T
HWP	TGT
IBM	TXN
JPM	TYC
KM	VIAB
LMGA	VOD
LU	WFC
MCD	WMT
MER	XOM
MO	XOX

Panel B. High trading volume and high share price

AIG	FOE	PBR
AVB	GPT	PP
BK	HPT	RKY
CB	JBL	SJR
CMS	KWD	SUS
CUZ	MC	TMK
DRE	MRK	UDS
EQT	NKE	WB
		ZQK

Table 1 (continued)

Panel C. High trading volume and Low share price

AOT	GRP	OMX
BBV	HRC	PNK
BRM	IRT	RI
CHH	KGC	SKO
CQBPRA	LTD	SZ
DL	MKT	TRP
ELY	MXE	USI
FMO	NR	WMS
		ACG

Panel D. Low trading volume and High share price

ALS	FIGPRA	PLPRP
AXPPRA	GIGPRA	PSTPRA
BPL	HIPRT	ROMPR
CBA	JPMPRC	SJI
CLPPRA	LMCPRY	SSSPRB
CSDPRA	MWC	TLMPRB
DREPRA	NUI	UBT
ENEPRT	OUI	WMK
		ZNT

Panel E. Low trading volume and Low share price

AP	GNA	OFG
BKE	HIF	PFP
BZL	IMY	PTM
CM	JWB	SBPPRA
CWF	LNCPRG	SQMA
CEE	MIJ	TMNPRA
FCP	NAP	UMGPRY
FTD	NPC	VTP
		ZNH

Table 2
Frequency of NYSE Trades with Execution Prices One Minimum Price Variation Better than the Contemporaneous National Best Bid or Offer (NBBO) Quoted Price for a Sample of 148 NYSE-listed Securities around the Switch to Decimal Pricing on January 29, 2001.[1]

Panel A. All New York Stock Exchange trades.

	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
Total Trades	388,487	469,010	726,639	628,294
Trades 1 tick better	107,229	48,945	63,098	66,922
% Trades 1 tick better	27.40%	10.44%	8.68%	10.65%
%Trades $0.02-0.06 better[2]	n.a.	17.12%	17.38%	8.95%
Total Shares	530,568,318	498,542,260	752,482,578	598,211,439
Shares 1 tick better	87,152,305	40,035,467	52,507,506	49,633,122
% Shares 1 tick better	16.42%	8.03%	6.98%	8.70%
% Shares $0.02-0.06 better	n.a.	12.34%	13.38%	6.58%

Panel B. New York Stock Exchange trades when the NBBO has at least 10,000 shares quoted.

	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
Total Trades	163,586	54,549	93,385	57,244
Trades 1 tick better	46,696	9,512	11,902	10,052
% Trades 1 tick better	28.54%	17.43%	12.75%	17.56%
% Trades $0.02-0.06 better	n.a.	19.16%	19.44%	10.67%
Total Shares	212,771,936	72,491,786	122,138,972	73,428,977
Shares 1 tick better	42,702,240	10,034,105	12,531,803	10,139,987
% Shares 1 tick better	20.07%	13.84%	10.26%	13.81%
% Shares $0.02-0.06 better	n.a.	13.79%	15.19%	7.70%

[1] The sample contains all executed NYSE market buy (sell) orders with execution prices one tick better than the order-receipt-time National Best Offer (Bid) quoted price when the NYSE quote equals the relevant national best quote. Before Decimals refers to the week of January 22-26, 2001. Decimals-Wk1 refers to the week of January 29-February 2, 2001. Decimals-Wk4 refers to the week of February 20-26, 2001. Decimals-Wk13 refers to the week of April 23-27. The minimum price variation in the Pre-decimal period is $0.0625. In the post-decimal periods it is $0.01.

[2] n.a. = not applicable.

Table 3

Specialist Participation in the NYSE Trades with Execution Prices One Minimum Price Variation Better than the Contemporaneous National Best Bid or Offer (NBBO) Quoted Price for a Sample of 148 Stocks around the Switch to Decimal Pricing on January 29, 2001[1]

Panel A. All New York Stock Exchange trades.

Trades	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
% Specialist only counter-party	28.11%	40.68%	32.76%	33.99%
% Specialist one of multiple counter-parties	6.00%	9.15%	8.10%	9.42%
Shares				
% Specialist only counter-party	20.65%	31.75%	26.76%	27.68%
% Specialist one of multiple counter-parties	14.48%	23.25%	19.32%	20.74%

Panel B. New York Stock Exchange trades when the NBBO has at least 10,000 shares quoted.

Trades	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
% Specialist only counter-party	26.76%	41.07%	31.98%	32.68%
% Specialist one of multiple counter-parties	5.16%	8.96%	7.06%	8.78%
Shares				
% Specialist only counter-party	20.40%	32.26%	27.31%	26.55%
% Specialist one of multiple counter-parties	14.41%	25.30%	19.18%	21.78%

[1] The sample contains all executed NYSE market buy (sell) orders with execution prices one tick better than the order-receipt-time National Best Offer (Bid) quoted price when the NYSE quote equals the relevant national best quote. Before Decimals refers to the week of January 22-26, 2001. Decimals-Wk1 refers to the week of January 29-February 2, 2001. Decimals-Wk4 refers to the week of February 20-26, 2001. Decimals-Wk13 refers to the week of April 23-27. The minimum price variation in the Pre-decimal period is $0.0625. In the post-decimal periods, it is $0.01. In addition to being listed as a counter-party to the trades, the specialist must purchase or sell for his own account to included in this table.

Table 4
Frequency of NYSE Quote Updates at Prices One Minimum Price Variation Better than the Contemporaneous National Best Bid or Offer (NBBO) Quoted Price for a Sample of 148 NYSE-listed Securities around the Switch to Decimal Pricing on January 29, 2001.[1]

Panel A. All New York Stock Exchange quote updates.

	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
Quotes 1 tick better	30,282	22,391	30,822	42,855
% with both sides of NBBO improved	1.06%	4.54%	4.82%	5.17%
System limit order precedes update[2]	26,170	18,134	26,340	37,507
% with preceding system limit order	86.42%	82.33%	85.46%	87.71%
New size/Old size[3]	4,200/15,800	2,000/5,900	2,100/5,000	1,700/4,500

Panel B. New York Stock Exchange quote updates when the NBBO has ≥ 10,000 shares quoted.

	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
Quotes 1 tick better	11,787	3,691	4,426	5,743
% with both sides of NBBO improved	1.19%	6.61%	6.39%	6.14%
System limit order precedes update	10,325	2,931	3,595	4,377
% with preceding system limit order	87.66%	79.41%	81.22%	85.11%
New size/Old size	6,200/30,500	3,800/22,500	4,100/19,700	3,600/20,100

[1] The sample contains all executed NYSE market buy (sell) orders with execution prices one tick better than the order-receipt-time National Best Offer (Bid) quoted price when the NYSE quote equals the relevant national best quote. Before Decimals refers to the week of January 22-26, 2001. Decimals-Wk1 refers to the week of January 29-February 2, 2001. Decimals-Wk4 refers to the week of February 20-26, 2001. Decimals-Wk13 refers to the week of April 23-27. The minimum price variation in the Pre-decimal period is $0.0625. In the post-decimal periods it is $0.01.

[2] System limit orders arrive via the NYSE's SuperDOT electronic order routing system. To be included in the count, the system order must be in the stock of interest, be on the appropriate side of the market, be of the appropriate limit price, and arrive within 30 seconds of the quote update.

[3] Quote size of the relevant side of the NBBO after/before the quote revision.

Table 5

Apparent Source of NYSE Quote Updates at Prices One Minimum Price Variation Better than the Contemporaneous National Best Bid or Offer (NBBO) Quoted Price for a Sample of 148 NYSE-listed Securities around the Switch to Decimal Pricing on January 29, 2001.[1]

Panel A. All New York Stock Exchange quote updates.

	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
Agency orders as a % of system orders[2]	68.54%	67.53%	60.145	44.71%
% of Quote Updates with Principal Order	42.15%	31.95%	46.93%	59.96%
% Pennying Quotes by Most Frequent Non-Floor Trader	11.16%	6.54%	10.66%	26.80%
% Pennying Quotes by 3 Most Frequent Non-Floor Traders	24.34%	18.47%	26.69%	39.24%
% Pennying Quotes by 5 Most Frequent Non-Floor Traders	33.70%	26.83%	35.40%	45.28%
New size: Principal Orders/All Orders[3]	4,100/4,200	2,100/2,000	1,900/2,100	1,300/1,700

Panel B. New York Stock Exchange quote updates when the NBBO has $\geq$ 10,000 shares quoted.

	Before Decimals	Decimals-Wk1	Decimals-Wk4	Decimals-Wk13
Agency orders as a % of system orders	67.95%	65,26%	60.37%	48.17%
% of Quote Updates with Principal Order	47.13%	36.33%	44.98%	58.18%
New size: Principal Orders/All Orders	6,100/6,200	4,100/3,800	3,700/4,100	3,000/3,600

[1] The sample contains all executed NYSE market buy (sell) orders with execution prices one tick better than the order-receipt-time National Best Offer (Bid) quoted price when the NYSE quote equals the relevant national best quote. Before Decimals refers to the week of January 22-26, 2001. Decimals-Wk1 refers to the week of January 29-February 2, 2001. Decimals-Wk4 refers to the week of February 20-26, 2001. Decimals-Wk13 refers to the week of April 23-27. The minimum price variation in the Pre-decimal period is $0.0625. In the post-decimal periods it is $0.01.

[2] System limit orders arrive via the NYSE's SuperDOT electronic order routing system. To be included in the count, the system order must be in the stock of interest, be on the appropriate side of the market, be of the appropriate limit price, and arrive within 30 seconds of the quote update.

[3] Quote size of the relevant side of the NBBO after/before the quote revision.